A PROSPECTIVE OPEN LABELLED NON RANDOMIZED PHASE-II CLINICAL TRIAL OF "*APPALAKARA CHOORANAM*" FOR

"*CEGANA VATHAM*"

(CERVICAL SPONDYLOSIS)

Dissertation submitted to

THE TAMILNADU DR. M.G.R. MEDICAL UNIVERSITY,

CHENNAI-32

For the partial fulfilment of the

requirement for the degree of

DOCTOR OF MEDICINE (SIDDHA)

(Branch-I Pothu Maruthuvam)

DEPARTMENT OF POTHU MARUTHUVAM

GOVERNMENT SIDDHA MEDICAL COLLEGE

PALAYAMKOTTAI, TIRUNELVELI - 627 002,

TAMIL NADU, INDIA

OCTOBER 2019

BONAFIDE CERTIFICATE

This is to certify that the dissertation entitled **"A PROSPECTIVE OPEN LABELLED NON RANDOMIZED PHASE-II CLINICAL TRIAL OF "*APPALAKARA CHOORANAM*" FOR *CEGANA VATHAM* (CERVICAL SPONDYLOSIS)" IS BONAFIDE WORK** done by **Dr.PASUPATHY THAVAKEETHAN (Reg.No.321611006)** Govt. Siddha Medical College, Palayamkottai - 627002 in partial fulfilment of the university rules and regulations of award for **MD (S) POTHU MARUTHUVAM (BRANCH-I**) under my guidance and supervision during the academic **year OCTOBER 2016-2019.**

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CERTIFICATE II

This is to certify that this dissertation work titled **"A PROSPECTIVE OPEN LABELLED NON RANDOMIZED PHASE-II CLINICAL TRIAL OF *"APPALAKARA CHOORANAM "* FOR *CEGANA VATHAM* (CERVICAL SPONDYLOSIS)"** of the candidate **Dr.PASUPATHY THAVAKEETHAN** with registration Number **321611006** for the award of **M.D (Siddha)** in the branch of **Pothu Maruthuvam**. I personally verified the urkund.com website for the purpose of plagiarism check. I found that the uploaded thesis file contains from introduction to conclusion pages and result shows percentage of plagiarism in the dissertation.

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I declare that the dissertation entitled **"A PROSPECTIVE OPEN LABELLED NON RANDOMIZED PHASE-II CLINICAL TRIAL OF "*APPALAKARA CHOORANAM* " FOR *CEGANA VATHAM* (CERVICAL SPONDYLOSIS)"** submitted for the degree of MD Siddha Medicine of Government Siddha Medical College, Palayamkottai, Tirunelveli, Tamil Nadu(The Tamil Nadu Dr. M.G.R. Medical University, Chennai) the record of work carried out by me under the supervision and guidance of **Prof.Dr.A.Manoharan,MD (S),(Ph.D).** Head, Department of PothuMaruthuvam, Govt. Siddha Medical College, Palayamkottai. This work has not formed the basis of award of any degree, diploma, associateship, fellowship or other titles in the university or any other university or institution of higher learning.

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ACKNOWLEGEMENT

My greatest gratitude goes to God for seeing me through the programme. I express my profound thanks to the Honourable Vice-Chancellor, Tamil Nadu Dr. M.G.R. Medical University, Chennai for permitting me to do this dissertation work.

My sincere thanks to **Prof. Dr.S.Victoria, MD(S),** Principal Government Siddha Medical College, Palayamkottai for permitting me to avail the facilities in this institution.

I extend my sincere thanks to Former Principal **Prof. Dr.R.Neelavathi, MD(S), Ph.D,** Government Siddha Medical College, Palayamkottai for permitting me to avail the facilities in this institution

I also wish to express my sincere gratitude to my supervisor, **Prof. Dr.A.Manoharan, MD(S), (Ph.D).** Head, Department of PothuMaruthuvam, Government Siddha Medical College, Palayamkottai, Tirunelveli for his encouragement, patience, guidance and his excellent supervision during my stay at the Department.

Also my deeply gratitude and thanks to Academic staff of Department of PothuMaruthuvamGSMC, Palayamkottai, Tirunelveli **Dr.T.Komalavalli, MD(S), Ph.D.** (Associate Professor), **Dr.S.Justus Antony, MD(S), Dr.G.Subash Chandran, MD(S),Ph.D, Dr.P.Sathishkumar, MD(S), Dr.Thomas Walter, MD(S) and Dr.S.Umakalyani, MD(S)** for their help and support me during study.

I extend my gratefulness to **Dr.A.Kingsly, MD,(S)** Head, Department of PG Gunapadam, GSMC, Palayamkottai, Tirunelveli for the help rendered in identification and authentication of Appalakaram, and mineral authentification by **Dr.M.Kamalutheen M.sc,M.phil,Ph.D,** Head& Assosiated Professor,Dept.of chemistry sadakathulla Appa College Tirunelveli. I express my deep sense of gratitude to **Mrs.N.Naga Prema, M.Sc, M.Phil.** and other staff members of the Department of Biochemistry who helped me in biochemical analysis of the trial medicines. I would like to express my heart full thanks to **Dr.M.Kalaivanan, M.Sc, M.Phil.,Ph.D.,** Lecturer, Department of Pharmacology, GSMC, Palayamkottai,

Tirunelveli, for his technical Guidance and valuable suggestions.I sincerely thank **Dr.N.Chidambaranathan, M.Pharm, Ph.D.** Vice Principal, K.M.College of Pharmacy, and Madurai who investigated the pharmacological actions of the trial medicine.

I whole heartedly thank to **Mrs.T.Poongodi, M.Lis, M.Phil.** Librarian for her assistance in collection of literatures.

My appreciation also goes to the entire laboratory staff, GSMCH, Palayamkottai for their help during the collection of samples.

Last but not least my appreciation and thanks to everyone who helped me in different ways during the study period.

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ABBREVIATIONS

%	-	Percentage
CT - Scan	-	Computerized Axial Tomography
X-Ray	-	Roentgen ray
MRI	-	Magnetic Resonance Imaging
CSF	-	Cerebrospinal Fluid
NDI	-	National Democratic Institute
WBC	-	White Blood Cell
OP	-	Out Patients
IP	-	In patients
AP View	-	Anterosposterior view
TC	-	Total count
DC	-	Differential count
ESR	-	Erythrocyte sedimentation Rate
Hb	-	Hemoglobin
HCl	-	Hydrochloride
IUG	-	Infragastric Catheter tube
IGC	-	Intra Gastric Catheter tube
Mg	-	Milligram
IVDS	-	Intra Vertebral Disc Stenosis
AKC	-	Appalakara Chooranam

ABSTRACT

Cegana vatham is a most commonest degenerative disease now a day. Its amplified occurrence in recent times is due to stress, strain and abnormal dietary habits. This disease affects the neck and upper extremities with its signs and symptoms like that of cervical spondylosis. I had arrived at the diagnosis of the disease by using siddha parameters like envagaithervugal, kaalam, Thinai, Mukkutra Verupadugal and modern parameters. *Appalakara chooranam* is a siddha mineral formulation mentioned in Gunapadam Thathu Jeeva Vaguppu (Part II & III) (Page No: 368) which is indicated for vatha diseases.

Therefore I desired to evaluate the efficacy of "*Appalakara chooranam*" in the treatment of *Cegana vatham*. For the purpose of standardization. clinical trial medicine was subjected to biochemical,anti-microbial and pharmacological analysis.Anti- inflammatory, analgesic, anti-ulcer activities were studied under pharmacological action.Safety profile of the trial drug was evaluated and no morbidity or mortality was noted in experimental animals.

20 OP and 20 IP patients of both sexes were selected and they were administered with the trial drug. At the end of the study majority of the cases which showed good clinical improvements.All the relevant reports were statistically analysed.

CHAPTER- I

INTRODUCTION

1.1.BACKGROUND

The modern industrialization imbalance the ecosystem which paves way for varied type of diseases. To uproot the disease there should be a system of medicine which goes hand in hand with nature. The typical example is Siddha system of medicine, which is one among the "AYUSH system. The unique nature of this system is its continuation of service to humanity from time immemorial.

The Siddha system of medicine is believed to be originated from Lord Siva and transmitted to eighteen Siddhars. The siddha system has been involved by the hard work and hearted contribution of Tamil sages called "Siddhars". Agasthiyar is a father of Siddha system of medicine.

Siddhars Classified the diseases as 4448 types .According to Yugi Vaithya Chinthamani-800 Cegana Vatham is coming under the 80 types of Vatha diseases. Cegana Vatham can be correlated in modern aspect as Cervical spondylosis.

The World Health Organization (WHO) estimated that 80% of populations were using traditional medicines in developing countries for primary health care needs. In that way, Siddha medicine has profound vital role in disease , prevention and prophylaxis through its herbal medicine and other form of medicine like chendooram, Parpam and other 32 types of preparation.

According to the classical text Noi nadal and noi mudhal nadal part 2 and yugi vaidhaya chinthamani800 are clearly mentioned that preclinical symptoms of Cegana Vatham (Cervical spondylosis). This is one of the most common degenerative disorders of the spine, affecting 95% of patients by the age of 65 years . The non-inflammatory disc degeneration is one of the defining characteristics of spondylosis. The majority of people with spondylosis are asymptomatic. Patients who are symptomatic tend to be older than 40 years old and presents 3 types of symptoms; neck pain, cervical radiculopathy, and/or cervical myelopathy [World Spinal Column Journal, Volume 2 / No: 3 / September 2011]

In recent times, pain in the neck is frequently reported from the public, as 80% of them are engaged with a profession which makes chronic flexion to the cervical vertebrae.

The media must be protected from degeneration, ageing and disease. So the siddhars followed specific type of life style and food style which was also included in this system.

Applakara choornam is coming under the heading of upa rasangal (120 varities) topic and it is one of the natural salts. The *applakara choornam* has taken from the classical siddha literatures and also mentoined *kaarasaaram* tittle or mineral formulation (Gunapadam Thathujeeva vaguppu [page:368). Guidelines of WHO and AYUSH insisted the guidelines for quality control to better standardization of the drugs as pertaining to Pharmacopoeia Laboratory of Indian Medicine(PLIM). The literature collections has been proved the individual constituents of the preparation possessing Anti inflammatory, analgesic and anti ulcer activities. The Systematic steps should be taken to the standardization of traditional drugs by using modern technique like SEM, EDAX, FTIR etc.

The pharmacological research works undergone on the constituents of the trial medicines ***Appalakara chooranam*** justified its potential effect in the clinical study of the management of *Cegana Vatham* (Cervical spondylosis).

1.2. AIM AND OBJECTIVES

AIM

A prospective open labeled phase-II Non-Randomized clinical study of *Appalakara chooranam for Cegana Vatham* (Cervical spondylosis).

OBJECTIVES:-

A. Primary Objective:

- To clinical evaluation and documentation of the therapeutic efficacy in clinical trial drug in *Cegana Vatham* .

B. Secondary Objectives:

- To findout the Anti inflammatory and Analgesic Pharmacological activity of *Appalakara chooranam.*
- To determine the additional effects and siddha parameters changes in *Cegana Vatham* .
- To carry out modern parametric changes in *Cegana Vatham* (Cervical Spondylosis).
- To determine safety profile of the clinical trial drug.
- To carry out the bio chemical analysis in Applakara choornam.
- Study about the prevalence of *Cegana Vatham* in relation between diet and lifestyle.
- To adjudge the Anti microbial and Anti ulcer study of the clinical trial drug.
- To assess contents of chemical compound performed through FTIR, SEM and XRD analytic methods.
- To discuss about prognosis and treatment effect after end of the study.

CHAPTER - II

REVIEW OF LITERATURES

2.1. IN JOURNAL ASPECT-- APPALAKARAM

I. Karthikeyan karu and vetha merlin kumara. 2012 was done a pharmacological work of Acute anti inflammatory studied by carageenan induced rat hind paw oedema and Chronic inflammotary study was carried out by cotton pellet granuloma of a mineral drug – appalakaram (impure sodium carbonate). At the end of result, he found applakaram was a moderate acute and chronic anti inflammotary activites, it was better result on osteo arthritis.

II. Senthil kumar and Moorthy et al.2011 had did a work of Standartation of anti arthritic, herbo mineral preparation by using FTIR-Heavy metal analysis. The results was confirmed the presence of metals, such as iron, copper, manganese, zinc, nickel, cobalt, arsenic, cadmium, lead and mercury.

Applakaram (Sodium carbonate)

Applakara Chooranam

2.2 IN SIDDHA LITERATURE

2.2.1. GUNAPADAM ASPECT - *APPALAKARAM*

Tamil name	:	*Appalakaram*
Other name	:	*Ulaman,Uvarman, Savudduppu*
Chemical name	:	Sodium carbonate,
Chemical composition	:	$Na_2 CO_3$

Pharmacological Actions : Anti inflammatory
Analgesic
Antispasmodic
Antacid
Antidote
Antiseptic
Alterative
Carminative
Diuretic

Nadkarani, 1993 was mentioned in his text book page no.101-10, the indications of *Applakaram*, further he mentioned that applakaram is antacid,alterative and diuretic in actions. The varities of Sodii carbonas impura (or) sodium carbonate is responsible to cure rheumatism (Antiinflammation) and kidney disorders.The same tobe quoted in gunapadam part II&III ,page no.368.In this text book additionaly lithotriptic and anti flatulance actions were added.

2.2.2 GUNAPADAM ASPECT - *APPALAKARA CHOORANAM*

Ingrediants of *Appalakara chooranam*

The various Siddha literatures collections are given below

Table No - I

Gunapadam Thathu Jeeva Vaguppu :Vol II&III pg no.368

NAME	PHARMACOLOGICAL ACTIONS	THERAPEUTIC USES IN SIDDHA
Appalakaram	Antiinflammatory Analgesic Antispasmodic Antacid	Vatha diseases Gunmam Soolai

Table No - II

Patharthaguna Vilakkam Thathu Jeeva Varkkam:pg no.24

NAME	PHARMACOLOGICAL ACTIONS	THERAPEUTIC USES IN SIDDHA
Savudduppu/Appalakaram	Antacid Carminative Antispasmodic	Dyspepsia Flatulence Rhumatism Diseases of mouth

Table No - III

T.V SAMPASIVAMPILLAI Pg 1267&1268

NAME	PHARMACOLOGICAL ACTIONS	THERAPEUTIC USES IN SIDDHA
Ulaman/ Appalakaram	Antiinflammatory Analgesic Antiseptic Antidote	Vatha diseases Thandaka vatham Reducing of Metal Toxic

The above tabe coloumn I & III showed *Appalakara Chooranam* was a good anti inflammatory and analgesic activities were present. So, this action was highly responsible to reduced the Cervical spondylosis pain.

2.2.3- IN SIDDHA ASPECT- VATHAM

DEFINITION:-

The biological function of the human health is governed by three distinct humours, It is known as vatham, pitham and Kapham. In a healthy man, these three humours are held in 1: ½ : ¼ ratio. When this humours is altered in ratio can caused by disease. It was mentioned in thirukural,

"மிகினுங் குறையினும் நோய் செய்யும் நூலோர்
வளிமுதலாவெண்ணிய மூன்று" - திருக்குறள்

The theriyar maruthuva bharatham was mentioned, the first phase of human life is attributed in earlier age to vatham, the middle age to pitham and remaining period was kapham.

"வாதமாய் படைத்துபித்தவன்னியாய் காத்து
சிலேத்துமசீதமாய் துடைத்து"

- தேரையர் மருத்துவ பாரதம்

SITES OF VATHAM

The vayu (Air) and Aahayam (space) was combained together to formed by Vatham.It is responsible for all movements of locomotar systems.

"நெளிந்திட்டவாதமபானத்தைப் பற்றி
நிறைந்திடையைச் சேர்த்துந்திக் கீழேநின்று
குளிந்திட்ட மூலமதுடெழுந்துகாமக்
கொடியிடையைப் பற்றியெழுங் குணத்தைப் பாரே

குணமானவெலும்பைமேற்றொக்கைநாடி
.....
நிணமானபொருத்திடமும் ரோமக் காலும்
நிறைவாகிமாங்கிசமெல் லாம்பரந்து
.....
.....
கால்காட்டிவாதமெங்குங்கலக்குந் தானே" - வைத்தியசதகம்

According to Vaithiyasathagam was mentioned in places vatham are,

* Rectum * Joints

* Umblicus	* Bones
* Hibjoint	* Skin
* Muscles	* Nervous plexus
* Hair follicles	* Anus

In Maruthuva thanipadalkal, Vatham is predominent in Small intestine, Bone, Ear, Thigh, Skin, Hip joint.

"உண்டிசமைத்துடற் கூட்டுங் குடற்பகுதி
திண்டிறலென்புசெவிகுறங்கு - விண்ட
தொடுவுணர்வுதோற்றுவிக்கும் தோலிடுப்பிவ்வாறும்
வடுவிலிடாமாம் வளிக்கு" - மருத்துவ தனிபாடல்கள்

"அறிந்திடும் வாத மடங்குமலத்தினில்"; - திருமூலர்

"நாமென்றவாதத்துக் கிருப்பிடமேகேளாய்
நாபிக்குக் கீழென்றுநவிலலாகும்" - யூகிமுனிவர்

"செப்புமுந்திசிதையும் வாதநிலை" - வைத்தியசாரசங்கிரகம்

According to *Thirumoolar*, *Yugimunivar* and *VaithyaSarasangraham*, the vatham is take place or dominated in below level the umbilicus.

NATURAL FUNCTIONS OF VATHAM

"ஒழுங்குடன் தாதேழ் மூச்சோங்கி இயங்க
எழுச்சிபெறஎப்பணியுமாற்ற - எழுந்திரிய
வேகம் புலன்களுக்குமேவச் சுறுசுறுப்பு
வாகளிக்கும் மாந்தர்க்குவாயு"

- மருத்துவ தனிபாடல்கள்

- Alertness
- Respiratory movements
- Mental and physical activities
- Elimination of the "fourteen physiological reflexes" (vegamgal)
- Functioning of the "Seven udalkattugal'
- Strengthening of the five sensory organs (Iymporigal)

DERRANGED (or) ALTERED VATHAM

The *Noinadal noimudhal nadal thirattu*-part I, page no 158, dearranged vatham can produce the following symptoms are**,**

- Bodyache
- Pricking pain
- Tearing pain
- Nerve weakness
- Tremor
- Rigidity
- Dryness
- Movements
- Weakness
- Throbbing pain
- Pain felt as that of traumatic cause
- Dislocation of joints
- Weakness of functional organs and loss of functions
- Constipation
- Retention of Urine
- Thirst
- Paralysis of limbs
- Severe pain in calf and thigh muscles
- Pricking pain in the bones
- All taste to be like astringent
- The skin, eyes, faeces and the urine are black in colour.

QUALITY OF VATHAM

The qualities and character of vatham is,

Hardness	-	Kadinam
Dryness	-	Varatchi
Subtility	-	lesu
Coldness	-	Kulirchi
Mobility	-	Asaithal
Minuteness	-	Anuthuvam

OPPOSITE REACTIONS OF VATHAM IS,

Soft	-	Mirudhu
Unctuous	-	Pasumai
Heaviness	-	paluvu
Hotness	-	Akini
Stability	-	Sthiram
Solid	-	Katti

RELATION WITH TASTE

The Noi nadal text and agasthiyar nadi is indicated Sour taste, it was increased vatham.

"சேத்தும மெழுந்திருக்கிற் தித்திப்பு நாவிலேறும்
ஏத்திய கசப்புமீறில் எழும்பிடும் பித்தமாகும்
மாத்திய புளிப்பு மீறில் வந்திடும் வாதமாகும்
சேத்துமந் தண்ணீர் பித்தத் தீகாற்றுவாதமாமே" - அகத்தியர் நாடி நோய் நாடல் பாகம் I, பக்க எண் 22

Aggravating factors

The Sour and Astringent tastes aggravates the Vatham. According to Noinadal part.I book is mentioned in same lines.

“புளிதுவர்விஞ் சுங்கறியாற் பூரிக்கும் வாதம்,
ஒளியுவர்கைப் பேறில் பித்துச் சீறும் - கிளிமொழியே
கார்ப்பினிப்புவிஞ்சிற் கபம் விஞ்சுஞ் சட்டிரதச்
சேரப்புணர் நோயணுகாதே” - நோய் நாடல் பாகம் I, பக்க எண் 23

Neutralising taste

According to kannusamiyam, Sweet, Sour and Salt taste will neutralize the increased vatham.

“வாதமேலிட்டால் மதுரம் புளியுப்பு
சேதமுறச் செய்யுஞ் சிறையம் - ஒதக்கேள்
காரந் துவர்கசப்புக் காட்டுஞ் சுவையெல்லாம்
சாரப் பரிகாரஞ் சாற்று” - கண்ணுசாமியம்
நோய் நாடல் பாகம் I, பக்க எண் 24

RELATION WITH ELEMENTS (Pancha Pootha Theory)

The combaination of air and space forms vatham; and fire alone formes the pitham and kapham is formed by combaination of water with earth.

Vatham	-	Air + space
Pitham	-	Fire
Kapham	-	Water + Earth

The combained two boothams forms one taste and constituent boothams as follows.

TASTE	BOOTHAMS
Sweet	Earth + Water
Sour	Earth + Fire
Salt	Water + Fire
Bitter	Air + Space
Pungent	Air + Fire
Astringent	Earth + Air

Alteration in Vatham

Vatham gunam is developing in Aadi, Avani, purattasi and Iyppasi tamil months.So, Vatha disease is mainly dominated in above months and Kadagam to Thulam rasi also inceases in above months.

The type of alteration of vatham are :

1. ThannilaiValarchi :- (தன்னிலை வளர்ச்சி)

Definition

The three humours are provoked in their own location it is called as "ThannilaiValarchi. It is called "**SanthiSamayam**"

Limitation

Hatefulness of the things which are causing aggravation and attraction to things having opposite quatation.

Duration

Vatham is aggravated in MudhuvenilKalam (Aani and Aadi).

2. Vetrunilai Valarchi :- (வேற்றுநிலை வளர்ச்சி) (Displacement of aggravation)

Definition

The Provoked humoursis displaced from their own location and aggravated in vetrunilaivalarchi. It is called as PrakobaSamayam.

Limitation

Signs and symptoms of the affected humours and the pathological conditions of the udalthathukkalgives the details of the limitations.

Duration

Vatham attains displacement of aggravation in "Kaarkalam (Aavani and Purattasi)

3. ThannilaiAdaidhal (தன்னிலை அடைதல்)

Definition

Provoked humours, which is neutralizing in its own character is called ThannilaiAdaidhal. It is called as SamanaSamayam.

Duration

The provoked vatham neutralizes during koodhirkalam (Iyppasi and Karthigai)

FACTORS WHICH ALTER VATHAM

"வாயுவின் குணத்துடன் கூடணுகில்
வாயுவினிடங்களில் நோய்களுண்டு
வாயுவில் குளிர்ச்சிதான் கூடிடிலோ
வந்திடும் நலிகளும் வேறிடத்தே
வாயுவில் அனல்தரும் நெய்ப்பமைந்தால்
வாயுவும் அடங்கிடும் வாய்மையிது
வாயுவின் பிணிகளைப் போக்கிடவே
வகுத்திடும் முனிமொழிகண்டிடுமே" மருத்துவ தனிப் பாடல்கள்

- When hot foods are mixed with vathamvatham gets "ThannilaiValarchi"
- When cold is mixed with vatham, "Vatham" gets "VetrunilaiValarchi"
- And when only foods with hotness are mixed with vatham, "Vatham neutralizes in its own property" that means healthy conditions.

CHARACTERISTICS OF VATHATHEGI

According to Pathinenn Siddhar Nadi Sasthiram, Vatha thegi body has in black or red in colour, rough and thickened skin, increased sexual activity, spermathorrea, body pain, loss of appetite and flatulence.

"கண்டாயோவாதத்தாலெழுந்ததேகம்
கட்டிமையாய்த் தடித்திருக்கங் கருமைசெம்மை
வண்டாகுங் குழலாள் மேலற் பவாசை
வாய்வுமிகும் போகமுறுமனஞ்சிக் கென்றவ்
உண்டாலேஅற்பவுணடிளரிப்போடுண்ணு
முறுதாறுகுறைச்சலுடம்புகளைஉசிதம்".

- பதிணென் சித்தர் நாடிசாஸ்தீரம்

According to *Siddha Maruthuvanga Surukkam*

Vathathegi has an appearance of

- Thin, tail built
- Bulky thigh
- Thick eye brows
- Cool sight
- Black and white mixed coloured skin complexion.
- Dark and fissured hair in scalp.
- Clear speech, sometimes slurring
- They have a desire of sweet, sour, salt and hot food stuff.
- Dislike in cold things.
- Over eating.
- Less strength.
- Less Sexual desire
- Impotency
- Predictable games, music, exercise, massage, hunting
- Theft
- Short interrupted sleep.
- Slumber with half closed eyes.
- Seeing the sky, mountain and forest in night dreams.

Features of increased vatham

- Body will become black and emaciation.
- Liking to eat hot foods.
- Tremor
- Distended abdomen
- Constipation
- Weakness
- Disturbance in sleep
- Diminished activities of the five sense organs.
- Slurring speech
- Vertigo
- Loss of perseverance

Features of Decreased Vatham

- Body Pain
- Low Voice
- Decreased physical activities
- Mental agony
- Syncope

MUKKUTRA VERUPAADUGAL

By any one or other etiological factors vatham is vitiated first. Then it affects the other dhosamspitham and Kapham which are in three dhosa equilibrium.Then the ten vayus, seven udalkatugal and other structures are also affected according to the severity of the illness.

In generally vatha diseases, Abanan, viyanan, samanan, Devathathan are affected. The Saram, Seneer, OOn, Kozhuppu and Enbu are affected in one by one.

Naadinadai

In vatha disease, the following naadi are showed in general.

1. Exaggeration of vathanaadi
2. Vathapitha thondhanaadi
3. Vathakabha thondhanaadi
4. Kabhavatha thondhanaadi
5. Kabhapitha thondhanaadi

2.3. SIDDHA ASPECT - CEGANA VATHAM

2.3.1. IYAL (DEFINITION)

Cegana Vatham is one among the 80 types of vatha disease which it was described by Yugi vaithya chinthamani 800. It is defined as a kind of neurologic pain affecting the neck and extending into the upper limb. It is attended with heaviness of body, giddiness, burning sensation of the eyes and dysuria.

T.V. Sambasivam pillai Dictionary

2.3.2. NOI VARUM VAZHI (ETIOLOGY)

Yugi has not mentioned specific symptoms of Cegana Vatham . He was summarised the causative factors for vatha disease. Yugi munivar mentioned various factors for the cause of vatha diseases, and includes various intrinsic and extrinsic factors can produce the vatha disease i.e Cegana Vatham . The various intrinsic and extrinsic factors are,

I. According to the yugi Vaithya chinthamani

“என்னவே வாதம்தா னெண்ப தாகும்
இகத்திலே மனிதர்களுக் கெய்யு மாறு
பின்னவே பெண்தனையே சோரஞ் செய்து
பெரியோர்கள் பிராமணரைத் தூஷணித்தும்
வன்னவே வச்சொத்திற் சோரஞ் செய்து
மாதாபிதா குருவை மறந்த பேர்க்கும்
கன்னவே வேதத்தை நிந்தை செய்தால்
காயத்திற் கலந்திடுமே வாதந் தானே”

- யூகி வைத்திய சிந்தாமணி (பாடல் எண் 243), பக்கம். 92

The yugimuni in chinthamani is noticed,the vatha disease can produced the following reasons are, Breach of trust, abusing the rituatists, exploiting the properties of charities, ingratitude toward mother, father and teacher and abusing holy suripisre.Intake of food with bitter, astringent,pungent taste, drinks, daysleep, insomnia, starvation, sexual desire also produced the vatha disease.

“தானென்ற கசப்போடு துவர்ப்பு றைப்பு
சாதகமாய் மிஞ்சுகிலுங் சமைத்த வண்ணம்
ஆனென்ற வாறினது பொசித்த லாலும்
ஆகாயத் தேறலது குடித்த லாலும்
பானென்ற பகலுறக்க மிரா விழிப்பு
பட்டினியே மிகவுறுதல் பார மெய்தல்
தேனென்ற மொழியார்மேற்சிந் தையாதல்
சீக்கிரமாய் வாதமது செனிக்குந் தானே”

- யூகி வைத்திய சிந்தாமணி பா.எண் 244, பக்கம் 92

In Agasthiyar Gunavagadam, the following reasons are produced the vatha disease.

Vatha disease caused by:

- Brain disease
- Renal disorders
- Sexually transmitted disease
- Spino-vertebral disease
- Menorrhagia
- Toxic organic and inorganic substances

“தொல்லை செய்ய இன்னும் வெகு வாதநோய்கள
தொல்லுலகில் மாந்தருக்குக் காண்பதுண்டு
எல்லையில்லை வாதநோய் நேர்மை தன்னை
இயல்பாக அறிந்திடவே விபரங் கேளே”

“விவரமடா அசதிசன்னி மூளை நோவு
விரிவான மூளையது மிருதுவாகி
இவனிதனில் திடமாகப் போவதாலும்
அப்பனே மூத்திரக் குண்டிக்காய் வியாதியாலும்
தவமுனிவர் தீர்காக்கை மேகரோகம்
தன்மையுள்ள முத்தண்டுக் கொடி வியாதி
அவமிலாப் பரிச நரம்பழுத்தங் கண்டாய்

அணுகுமடா வாதநோய் ஆடும்பாரே”

“அணுகுமடா மாமிசத்தின் வியாதியாலும்
அப்பனே சூதகத்தின் பெருக்கலாலும்
குணமில்லா இரசம் வங்கம் தின்னலாலும்
குடிகெடுத்த வாதமது உண்டாமப்பா”

- அகத்தியர் குணவாகடம் (பக்க எண்: 542)

According to Sabapathy Kaiyedu:-

Diet which provoked vatha, curd, irregular food and in appropriate diet, cold exposure, increased sexual desire can cause vatha disease.

“வாரிதரு காய்கிழங்கு வரைவிலா தயிலல் கோழை
முனிதயிர் போன்மிடுக்கு முறையிலா வுணவு கோடல்
குளிர்தரு வளியிற்றேகங் குனிப்புற விலவல் பெண்டிர்
களிதரு முயக்கம் பெற்றோர் கடிசெயல் கருவியாமால;”

- சபாபதி கையேடு

According to Theraiyar vahadam

High exposure in sunlight, polyphagia, frequently sexual contact, untime food intake can caused by vatha disease.

“வெய்யிலில் நடக்கையாலும் மிகத் தண்ணீர் குடிக்கை யாலும்
செய்யிழை மகளினாளைச் சேர்ந்தனு பவிக்கையாலும்
பையவே உண்கையாலும் பாகற்காய் தின்கை யாலும்
தையலே வாதரோகஞ் சனிக்குமென் றறிந்து கொள்ளே”

- தேரையர் வாகடம் (பக்க எண்:78)

According to pararasa sekaram - vatha roga nithanam

“தொழில்பெறு கைப்புக்காரந் நல்துவர்த்தல் விஞ்சுகிலுஞ் சோறும்
பழையதாம் வரகு மற்றைப் பைந்தினை யருந்தினாலும்
எழில்பெற பகலுறங்கி இரவினிலுறங்கா தாலும்
மழைநிகர் குழலினாளே வாதங்கோ பிக்குங் காணே”

“காணவே மிகவுண்டாலுங் கருதுபட் டினிவிட்டாலும்
மானனை யார்கண் மோக மறக்கினு மிகுத்திட்டாலும்
ஆணவ மலங்கடம்மை யங்ஙனே விடாத தாலும்
வானுதன் மடநல் லாளே வாதங்கோ பிக்குங் காணே”

- பரராசசேகரம் வாதரோக நிதானம்

According to pararaja sekaram –vatha roga nithanam , excessive intake of bitter, astringent, pungent taste, foods contained previous day rice, ragi, day time sleep, insomnia, over eating, starvation, over sexual activity, anger and anxiety can produce vatha disease.

According to thirukural

The three vital humours which increase or decrease caused by vatha disease.

“மிகினுங் குறையினும் நோய் செய்யும் நூலோர்
வளி முதலா வெண்ணிய மூன்று” - திருக்குறள்

According to Agasthiyar kanma kaandam - 300

“நூலென்ற வாதம் வந்தவகை தாணேது
துண்மையாய் கன்மத்தின் வகையைக் கேளு
காலிலே தோன்றியது கடுப்பதேது
கைகாலில் முடக்கியது வீக்கமேது
கோலிலே படுகின்ற விருட்ச மான
குழந்தை மரந்தன்னை வெட்டல்மேல் தோல்சீவல்
நாலிலே சீவசெந்து கால்முறித்தல்
நல்ல கொண்பு தழை முறித்தல் நலித்தல் தானே”

- அகத்தியர் கன்மகாண்டம் (பாடல் 56)

- Cutting the trees
- Breaking the legs of living animals
- Cutting the branches and leaves of living

According to Manmurukkyam

High intake of cold, excessive oily foods, excessive sexual activity, insomnia, drinking contaminated water, stress, blood loss, anger, depression, weight loss, prolonged illness, genital ulcer, starvation, deficiency of hormones, nerve plexus injury, bone degeneration and toxic medicines may caused by vatha disease.It was mentioned in man murukiyam text book.

"குளிர்ச்சியும் நொய்மையும் முடையன வுண்ணல்
புணர்ச்சி மிகுத்தல் உறக்கம் நீக்கல்
மாசும் நீரும் ஆக படுதல்
தாங்கா முயற்சிகள் தகையறச் செய்தல்
குருதி குறைதல் நினைவு மிகுதல்
துயர் சினம் முதலிய மிகுப்படல்
வடிய முதல மெலிந்து போதல்
கடும் பிணியுறுதல் அகட மெலிதல்
உள்ளுறுப்பிற் சில நீங்கல் வீழ்தல்
கருவாயிற் புண்படல் உடல் நுறுங்கிடுதல்
உயிர்நிலை தாக்கல் உண்ணா திருத்தல்
உடம்பில் பால்கள் மிகக் குறைந்திடுதல்
உணர்ச்சி நிலைகள் உறத் தாக்கிடுதல்
என்பு சிதைதல் நஞ்சு மருந்துண்ணல்
என்பவும் பிறவும் வளிய நோய்கட்
கடிப்படையாக அறிதல் நலமே"

- மான் முருக்கியம்

2.3.3 POTHU KURIGUNAM (CLINICAL FEATURES)

According to Yugi vaithya chinthamani the clinical features of Cegana Vatham was clearly explained,

"கேளுமே கழுத்தின் கீழரைக்கு மேலும்
கெடியான கரமிரண்டு மிகவே நொந்து
வாளுமே சரீரமெல்லாங் கனத்தி ருக்கும்
வாலிபர்க்கு மனங்கண்ணு மயக்கமாகும்

ஏளுமே யிரண்டு கண்ணு மெரிச்ச லுண்டாம்
ஏற்றமாய் மலந்தானு மிறுகிக் காணும்
தேளுமே கொட்டினது போற்கடுக்கும்
செகன வாதத்தினிட தீர்க்கந் தானே"

- யூகி வைத்திய சிந்தாமணி 800 பாடல் எண்.280, பக்கம் எண்.107

Clinical Features are:

1. Neck pain
2. Radiating pain in the upper limbs
3. Heaviness of the body
4. Giddiness
5. Constipation
6. Pain like scorpion sting
7. Tingling sensation and numbness of the upper limbs
8. Burning sensation of the eyes.

According to pararasasekaram,

"கண்டதோர் சகன வாதங் கழுத்தின் கீழரைக்கு மேலும்
மிண்டலங் கரமிரண்டு மிகநொந்து கணத்திருக்கும்
மண்டியே திமிர்த்துக் குத்தும் வலி மிகத்துளைவுண்டாகும்
வண்டமர் குழலினாளே மதியினாலுன்னு வாயே".

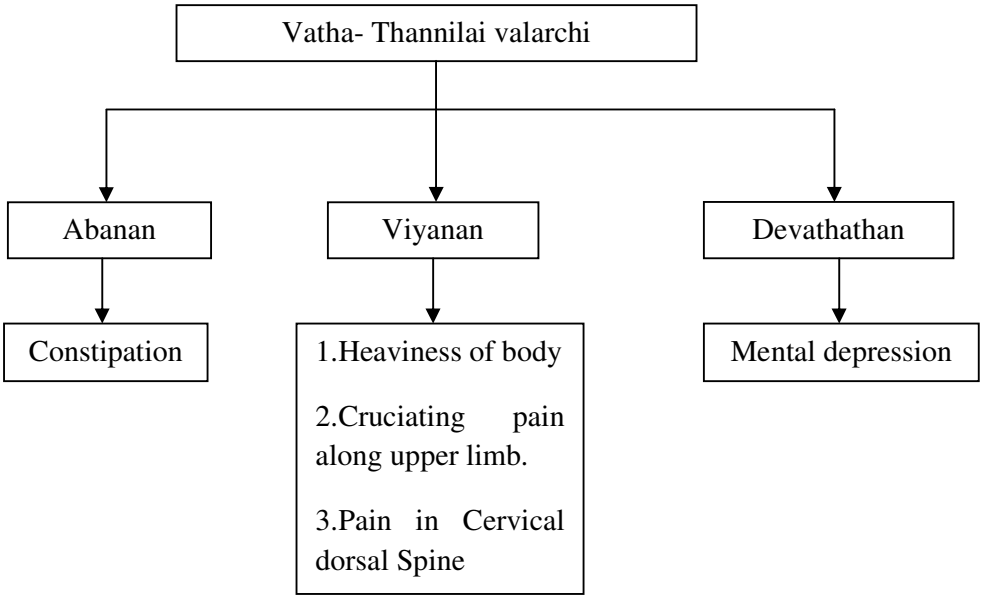
- பரராசசேகரம்

- Pain in the neck
- Radiating pain in the upper limbs
- Tingling sensation in the upper limbs.

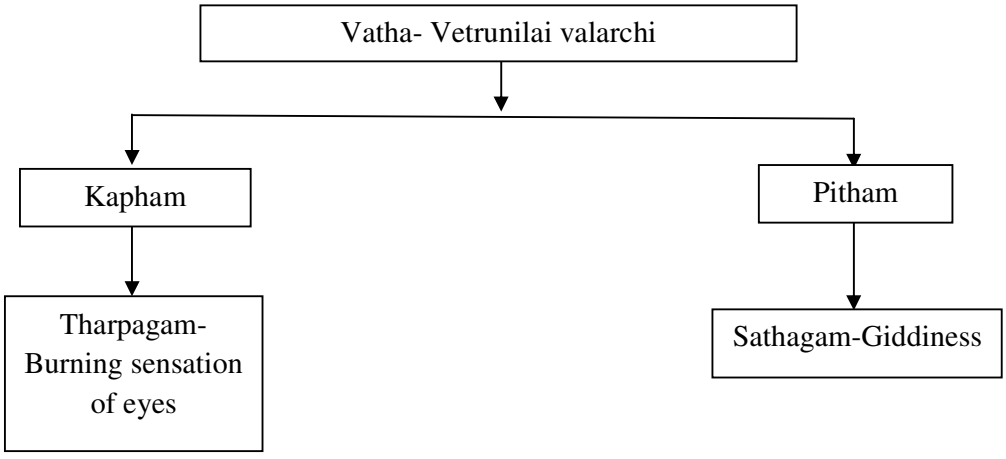
2.3.4.MUKKUTRA VERUPAADUGAL: (PATHOGENESIS)

According to siddha aspect

First Degree Derangement:



Second degree derrangement:



“வாதமலாது மேனி கெடாது”

According to theraiyar, the primary factor which affects first is vatham, which is accompanied by the vitiation of pitham and kapham. The factors which affect the vatha humour are irregular food habits, physical activities and alternations in the atmospheric temperature according to the severity of illness. Ten vayus, seven udal kattugal and other structure are also affected.

Vatham

In Cegana Vatham are mostly affected in Abanan, Viyanan vayus. Both vayus are produced neck pain, pain radiating pain towards to the upper limbs, restricted movements in the neck. Samanan and devathathan are also affected.

Pitham

In Cegana Vatham, Pitham mostly affected in sathaga pitham. It cans produces difficulty in performing regular works because neck pain and pain radiating towards the upper-limbs.

Kapham

In Cegana Vatham patients have , santhigam and Tharpagam ar affected, it can produce the pain and stiffness neck and difficult in movements.

Seven udal thathugal

In Cegana Vatham , saram was affected and cause tiredness of body. Senneer affected, which leads to anemia. Oon and kozhuppu was affected in cegana vatham patients, it can produce weekness of bone and sclerotic changes and intervertebral disc degeneration in the cervical vertebrae.

2.3.5.PINIYARIMURAIMAI (DIAGNOSIS)

The methods of diagnosis in siddha is,

1. Poriyal Aridhal (Inspection)
2. Pulangalal aridhal (Palpation)
3. Vinadhal (Interrogation)
4. Envagai Thervugal

Some other parameters used to confirm the diagnosis. They are,

1. Mukkutrangal (Three humors)
2. Udalkattugal (Seven body structures)
3. Udal vanmai (body strength)
4. Thinai (land and place)
5. Kaalam (Season)

1. Poriyal Aridhal (Sensory Organs)

PORIGAL(SENSORY ORGANS)	
Mei	Skin
Vai	Tongue
Kan	Eye
Mooku	Nose
Sevi	Ear

2. Pulangalal aridhal

PULANGAL (SENSATION)	
Ooru	Touch
Osai	Sound
Suvai	Taste
Oli	Vision
Natram	Smell

The Cegana Vatham , neck pain, pain radiating towards upper limbs, numbness and stiffness of neck, because Ooru is affected.

KANMENTHIRIYANGAL (MOTOR ORGANS)

- Kai - Movements of the hands
- Kal - for walking
- Vai - for speaking
- Eruvai - for defecation
- Karuvai - for reproduction

In Cegana Vatham patients, eruvai, kai has affected.

3. Vinadhal (Interrogation)

The questions form the patients name, age, sex, occupation, history, residence, family history, socio-economic status, diet, habits, complaints of the illness, past history, treatment history have been recorded before starting the treatment.

4. Envagai thervugal

The unique diagnostic principle in siddha system of medicine is 'Envagai Thervugal. Siddhars describe in many of their literatures that "Envagai Thervugal in an instrument for a siddha physician to examine and diagnose a patient.

"நாடிப் பரிசம் நா நிறம் மொழி விழி
மலம் மூத்திர மிவை மருத்துவ ராயுதம்" - தேரையர்

"மெய்க்குறி நிறத்தொளி விழிநாவிருமலம் கைக்குறி" - தேரையர்

According to gunavagada Nadi,

"தரணியுள்ள வியாதிதன்னை யட்டாங் கத்தால்
தானறிய வேண்டுவது யேதோ வென்னில்
திரணிய தோர் நாடிகண்கள் சத்தத் தோடு
தேகத்தினது பரிசம் வருணம் நாக்கு
இரணமல மூத்திர மா மிவைக ளெட்டும்
இதம் படவே தான்பார்த்துக் குறிப்புங் கண்டு"

- குணவாகட நாடி (பக்க எண்:136)

According to Thanvanthiri Vaithiyam,

"திருமறை முனிவன் கூறும் வாகடச் செய்கை தன்னில்
வருபல வியாதி யான வகையறி குவதே தென்னில்
உருவுறு நாடியாலு மொண்முக மலநீராலும்
தெரிவிழி நாவி னாலுந் தந்தலந் கணத்தி னாலும;"

- தன்வந்திரி வைத்தியம் (பக்க எண்:278).

- Nadi - Pulse
- Sparisam - Palpation
- Naa - Tongue
- Niram - Colour
- Mozhi - Speech
- Vizhi - Eyes
- Malam - Faeces
- Moothiram - Urine

Among Envagai Thervugal, the chief parameter for diagnosis is "pulse reading". The siddha physician's fingers resemble a stethoscope.Pulse can be felt at one inch below the wrist on the radial artery by palpating it with the physician's tip of index, Middle and ring fingers corresponding Vatham, Pitham, Kapham respectively.The normal ratio of 1: ½: ¼ Vatham: Pitham: Kapham. This ratio is altered can caused by disease. Nadi may be studied at ten places in the body which are heel, genital organs, abdomen, chest, ear, nose, neck, hand, temporal and vertex.The three vital humours are formed by the following combinations are,

NADI	VAYU	HUMOURS
Edakalai	Abanan	Vatham
Pinkalai	Pranan	Pitham
Suzhumunai	Samanan	Kapham

In cases of vatha diseases the following stages of Naadi nadai are seen

a. Vatha Naadi

"வாதமெனும் நாடியது தோன்றில்
சீதமந்தமொடு வயிறு பொருமல் திரட்சி வாய்வு
சீத முறுங் கிராணி மகோதரம் நீராமை
திரள்வாய்வு சூலை வலிகடுப்புத் தீரை" - சதகநாடி

According to sadhaga nadi, incresead vathan can cause by diarrohea, dysentery, flautulance, ascieties and neuritic pain. The kaviya nadi described in vatha disease was mainly produced painful joints.fatiquness and painful joints are present in vatha diseases, it was quoated to agasthier.

"காணப்பா வாத மீறில் கால்கைகள் பொருந்தி நோகும்"

- காவிய நாடி

"சொல்லவே வாதமது மீறிற் றானால்,
சோர்வடைந்து வாயுவினால் தேக மெங்கும்
மெல்லவே கைகால்க ளசதி யுண்டாம்
மெய்முடங்கும் நிமிரவொண்ணா திமிரூன்டாகும்"

- அகத்தியர்

b. Vatha pitha Nadi

"பொருளான வாதத்தில் பித்தஞ் சேர்ந்து
.....
.....
கருவான தேகமதி லுளைச்சல் சோம்பல்
கைகால் தறிப்பு நாக் கசக்கு மன்னம;".

- சதக நாடி

"திருத்தமாம் வாதத்தோடே தீங்கொடு பித்தஞ் சேரிற்
பொருத்துகள் தோறும் நொந்து போதவே பிடிக்கும்".

- நோயின் சாரம்.

According to above poem Sadhaga nadi and Noin saram book mentioned, the increased vatham pitham can produce the painful joints and neuritic pain.

c. Vatha Kapha Naadi

"பாங்கான வாதத்தில் சேத்தும நாடிப்
பரிசித்தால் திமிர்மேவு முறைச்ச லாகும்
தீங்கான இருமலுடன் சந்தி தோடம;"

- சதக நாடி

"வாதத்தில் சேத்துமமாகில் வலியோடு வீக்க முண்டாம்"

- அகத்தியர் நாடி

d. Pitha Vatha Naadi

"பித்தத்தில் வாதமாகில் பிடரியுங் காலுங் கையுங்
குத்தது போலேயாகுங் குறுதிமெய் பதறும் பின்னே"

- அகத்தியர் நாடி

e. Pitha Kapha Naadi

"பித்தத்தில் சேத்துமமாகில் பிதற்றும் வாய் குளறு மிக்க
.....
.....
பித்தமு மெடுத்துக் கொட்டிப் பிடரியில் நோவ தாமே".

- அகத்தியர் நாடி

f. Kapha Vatha Naadi

"கண்டாயோ சிலேற்பனத்தில் வாத நாடி
.....
.....
உறுதிரட்சை வாய்வுவலி சந்தி தோடம;"

- சதக நாடி

The following books were clearly noticed that increased vatha kabham, pitha vadha nadi, pitha kabha nadi and kabha vatha nadis are mainly affected in this disease.

2. Sparisam

The temperature of the skin, smoothness and roughness, sweat, dryness, hard patches, swelling, abnormal growth, tenderness and nourishment can be felt.

In Cegana Vatham there was pain and tenderness in the cervical region and generaly body was slight warmth, swelling may be present in the neck and extremities.

3. Naa

The yugi munivar in yugi vaithiya chinthamani book, tongue is blackish in colour, and fissure in tongue are predominantly noted.

"கருதியே வாதரோ கிக்கு நாக்கு
கறுத்திருக்கு முள்ளுபோலவெ டித்திருக்கும;"

- யூகிவைத்திய சிந்தாமணி 800
பா.எண். 135, பக்க எண். 50

4. Niram (Colour)

Palor, cyanosis, yellowish and other discolouration of the skin should be noted. The type of body is confirmed by the skin colour whether in black (Vatha), red or yellow (pitha), white (Kaba) and mixed colours (mixed humours).

[Noinadal part I and II]

5. Mozhi (Speech)

In ceganavatham patients have high or low pitched voice, slurred speech or aphasia, or dysarthria and hoarseness of voice can be observed from this study.In Cegana Vatham speech may be varying according to changes in the three humours.

[Noinadal part I and II]

6. Vizhi (Eye)

In Cegana Vatham patients vizhi was not affected.

7. Malam (Faeces)

Nature, quality, colour, odour, froth and abnormal consistency, constipation, diarrhoea, presence of blood mucus, pus, undigested matter, tenesmus can be noted. In pulipani mentioned all the Cegana Vatham patients faeces is black or normal in colour and constipation is mainly present.

"'மலமது கட்டி முட்டி யாயிடும் வாதத்திற்கு"

- புலிப்பாணி.

8. Moothiram (Urine)

According to theran neerkuri and nei kuri nool, the urine examination is classified into two main types. They are,

a. Neer Kuri - Physical examination of urine.

b. Nei Kuri - Oil examination.

"அருந்துமாறிரதமும் அவிரோதமதாய்
அகல் அலர்தல் அகாலவூன் தவிர்ந்தழற்
குற்றள வருந்தி உறங்கி வைகறை
ஆடிக்கலசத் தாவியே காது பெய்
தொரு முகூர்த்தக் கலைக்குட்படு நீரின்
நிறக்குறி நெய்குறி நிருமித்தல் கடனே"

- தேரன் நீர்குறி நெய்குறிநூல்

Neerkuri

The urine analysis is carried in used five parameters,namely

"வந்த நீர்க்கரி எடை மணம் நுரை எஞ்சலென்
றைந்தியலுளவவை யனறகுது முறையே"

- தேரன் நீர்குறி நெய்குறிநூல்

Niram	-	It indicates the Colour of urine
Manam	-	It indicates the smell of urine
Eadai	-	It indicates specific gravity of Urine
Nurai	-	It indicates frothy of urine
Enjal	-	It indicates quantity of Urine

In addition to frequency, urgency, hesitancy of micturation, painful burning micturation sedimentation and any associated discharges can be analysed. In Vatha disease dysuria and hesidency of urination can be noted.

Neikuri

"நிறக்குறிக் குரைத்த நிருமாண நீரிற்
சிறக்க வெண்ணெய்யோர் சிறுதுளி நடுவிடுத்
தென்றுறத் திறந்தொலி ஏகாதமைத்ததி
னின்றதிவலை போம் நெறிவிழியறிவும்
சென்றது புகலுஞ் செய்தியை யுணரே."

If the drop of oil,the following appearance can observed.

- lengthens like a snake it indicates vatha disease
- spreads like a ring it indicates pitha disease
- Appears like a pearl, it indicates kapha disease

UYIR THATHUKKAL (Three humours)

VATHAM

முறையாம் பிராணனோ டபானன் வியானன்
மூர்க்கமா முதானனொடு சமான னாகன்
திறமையாங் கூர்மனொடு திரித ரன்றான்
தேவதத்த னோடுதனஞ் சயனுமாகும;"

- யூகி வைத்திய சிந்தாமணி
பா.எண்.38, பக்க எண்.15

Vatham is classified into ten types. Motor and sensory activities are counted by vatham. Types of vathams are,

- Pranan
- Abanan
- Viyanan
- Udhanan
- Samanan

- Nagan
- Koorman
- Kirukaran
- Devathathan
- Dhananjeyan

1. Piranan

"பலபலவாம் பொசிப்பெல்லாஞ் சீரணம தாக்கும்
முன்ன நாழிகைக்கு முந்நூற்றறுபது சுவாசம;"

- யூகி வைத்திய சிந்தாமணி 800
பா.எண்.39, ப.எண்.15

Piranan regulates the respiratory system and digestive system. It is other wise termed as 'Uyirkkaal".

2. **Abanan**

"மருக்கவே கீழ்நோக்கி மலம்நீர் தள்ளும்
வாகாக நிறந்தானும் பச்சை யாகும்
அருக்கவே ஆசனத்தைச் சுருக்கி வைக்கும்
அன்னசாரத் தையெல்லாம் சேரவைக்கும;"

- யூகி வைத்திய சிந்தாமணி 800
பா.எண்.41, ப.எண். 16

The function of abanan is to control excretion of stools, sweating, micturation, ejaculation of sperms, menstruation and parturition.

3. Udhanan

"பூமான மன்னசாரம் தன்னைத்தான்
பொருந்தவே சமீபித்து நிறுத்தி வைக்கும்
காமனா யெடுப்பித்துக் கலக்கி வைத்தும்
கலக்கியே வகுத்துவைக்கும் வளப்பமாகும;"

- யூகி வைத்திய சிந்தா மணி 800
பா.எண்.43, ப.எண். 16

The udhanan duty is to control the breathing and speech. It is also responsible for the reflex actions like vomiting, hiccough, cough and digestion.

4. Viyanan

சிறப்பான வியானனது தோளில் நின்று
திகழெழுபத் தீராயிர நாடியிலுங் சென்று
தறுப்பான சரவசரந் தனிலே நின்று
தானீட்டல் முடக்கல் பண்ணி பரிசங்களறியும்

- யூகி வைத்திய சிந்தாமணி.
பா. எண்.42, ப.எண். 16

The viyanan is mainly helped in regulate the circulation of various parts of the body. It makes both the movable and immovable parts in the body of function make them to stretch and flex. It is otherwise termed as paravukaal.

5. Samanan

“வாமென்ற வாய்வுகளை மிஞ்சவொட்டாமல்
மடக்கியே சமன்செய்து மருவப் பண்ணும்
தாமென்ற வறுசுவைடையத் தண்ணீ ரன்னம்
சமன் செய்து சரீரமெல்லாம் சாரப் பண்ணுமு;”

- யூகி வைத்திய சிந்தாமணி 800
பா.எண்.44, ப.எண்.17

Samanan balancing other types of vayus, six taste, water and food are equally distribution all over body.

6. Nagan

தெய்வமா நாகனிட சிறப்பைக் கேளாய்
செயலான சகலகலை யாக்கி வைத்து
பைவமாய்ப் பாடி வைக்கும் கண்விழிப் பிக்கும்
பாங்காகச் சிமிளிக்கும் ரோமமசை விக்கும்

- யூகி வைத்திய சிந்தாமணி 800
பா.எண்.45, ப.எண்.17

Nagan is responsible for intelligency and it was responsible for blinking, opening of eyelids and raising eye brows.

7. Koorman

"நிமைகொட்டுங் கொட்டாவிதானுங் கொள்ளும்
நேராக வாய்மூடும் பெலலுண்டாகும்
கமைக் கொட்டுங் கண்விழிக்கு மூடப் பண்ணும்
காட்சியெல்லாங் காண்பிக்கும் விழி நீரோடும";

- யூகி வைத்திய சிந்தாமணி 800.
பா.எண்.48, ப.எண்.17

Koorman is responsible for blinking of eyelids, yawning, closing mouth and strengthen of the body.

8. Kirukaran

"கமைக் கொட்டுங் கிருதராதியின் குணந்தான்
கடுநாவு நாசிதனிற் கசிவுண்டாமே
கசிவுண்டாங் கடும்பசியின் கன்மஞ் செல்லும்
கண்ணியே விருத்தலோடு போதலாகும்
துசிவுண்டாய் தும்மலோ டிருமலுண்டாகும;"

- யூகி வைத்திய சிந்தாமணி 800
பா.எண்.47, ப.எண்.18

Kirukaran is responsible for salivation, nasal secretion and increased appetite.

9. Devathathan

"குசிவுண் டாம் தேவதத்தன் குணத்தைக் கேளாய்
குடிதலமாய்ச் சோம்பு முறித்திடுதெ லாமே
முறித்திடுதன் மொழிக்கும் போமுயற்சி யாகி
முகுளிதமாய்க் கண்ணினையே யோடி யுலாவித்துத்
தரித்திடுதல் சண்டை கொளற் றாக்கல் பேசல்
சண்டாளக் கோபத்தை உண்டு பண்ணல";

- யூகி வைத்திய சிந்தாமணி 800
பா.எண்.47, ப.எண்18

The devathathan can produced lazziness and walking difficulties. It is responsible for eyeball movements, anger, argument and quarrel etc.

10.Dhananjeyan

தரித்திடுநற் றனஞ் செயனைச் சாற்றக் கேளாய்
சாங்கமாய் மூக்கினின்று தடிக்குந் தானே
தடித்துமே உடம்பெல்லாம் வீங்கப் பண்ணும்
தந்திரமாய் கன்னத்திற் சமுத்திரம் போலத்
திடித்துமே சுந்தரமாய் கோட்டமாகித்
திரண்டுமே துஞ்சிய காலந் தனிற்றான்

- யூகி வைத்திய சிந்தாமணி 800
பா.எண்.49, ப.எண்.19

It is responsible for swelling all over the body. It also produce tinnitus and blowing up the cranium on the third day after death.

THE FOLLOWING VAYU'S ARE AFFECTED IN CEGANAVATHAM

1.VATHAM

VATHAM	FUNCTIONS
1. Viyanan	Neck pain, restricted neck movements, radiating pain in neck and upperlimbs, tingling sensation, numbness and giddiness.
2. Abanan	Constipation
3. Samanan	Indigestion, imbalance in the function of other vayu
4. Devathathan	Sleeplessness

2. PITHAM

Pitham is formed by the element fire (thee). It maintains the body temperature. Pitham regulates the function of thermogenesis, metabolism, digestion and maintaining the skin colour and blood.

Five types of pithams are,

PITHAM	FUNCTIONS
1. Analagam	Responsible for digestion
2. Ranjagam	Gives nutrition to blood.
3. Sathagam	Responsible for willful activities.
4. Prasakam	Gives luster to skin
5. Alosakam	Gives strength to eyes

In Cegana Vatham Analapitham may or may not be affected. Ranjagam may or may not be affected according to patient haemoglobin level Sathagam affected and there by difficulty in performing usual works.

3. KAPHAM

Kapham is formed by earth and water . It is cited to the head and neck. kapham represents feeling of cold, heaviness, mucous discharge and saliva. Five types of kapham and their functions are,

KAPHAM	FUNCTIONS
1. Avalambagam	Responsible for respiration
2. Klethagam	It lubricates the blood
3. Pothagam	Responsible for taste sensation
4. Tharpagam	It acts as a coolant for eyes
5. Santhigam	It acts as a coolant for eyes

In Cegana Vatham patients Tharpagam and Santhigam was affected,it can produce burning sensation of eye and neck pain.

UDAL KATTUGAL

Seven udalkattugal and its function are given below.

UDALKATTUGAL	FUNCTIONS
1. Saram	Strengthens the body and mind
2. Senneer	Preserves brightness boldness power and knowledge.
3. Oon	Gives structure and shape to body.
4. Kozhuppu	Lubricates the joints
5. Enbu	Construction of body structure
6. Moolai	It is present in the bones and gives strength to them
7. Sukkilam (or) Suronitham	Meant for reproduction and inheritances.

In Cegana Vatham affected udalkattugal are,

If Saaram affected can produce tiredness of body. If Seneer affected can produce anaemia is present. If Oon, Kozhuppu and Enbu affected can produce muscle wasting ,restricted neck movements and degeneration in cervical vertebrae and Osteophytic changes are presented in cehana vatham disease.

Thinaigal (Land)

Geographically land is divided into five

"குறிஞ்சி நிலமே வாதமாங் கூறும் பாலை பித்தமதாஞ்
செறிந்த மருதஞ் சிலேத்மமதாஞ் சிலேத்ம வாத முல்லையதாம்
நிறைந்த நெய்தல் வாதபித்தம் நிலங்களதனை மயக்காய்
லுறைத்த வியாதி கலந்திருக்கு முபாய மறிந்து செய்வீரே"

- தன்வந்திரி நாடி

Vatham is mainly provokes in kurinji, mullai and neithal land.

1. Kurinji (Hills area)

1. Mountain and its sourroundings
2. Commonly seen in kabham and liver related disease.

2. Mullai (Sylvantract)

1. Forest and its surroundings
2. Commonly produced in pitham and vatham releated disease.

3. Marutham (Agricultural land)

1. Fields and its surroundings
2. Ideal place for healthy living

4. Neithal (Coastal area)

1. Ocean, Sea and its surroundings.
2. Commonly produced in vatham and liver disease.

5. Paalai (Desert)

1. Desert and its surroundings
2. Vatha pitham and Kapham releated disease can occurred in this place.

Paruvakaalangal

According to alteration of kaalam thannilai valarchi ,vetrunilai Valarchi in the disease can be diagnosed by,

S.No	Kaalam	Kuttram	State of kuttram
1	Kaarkaalam (Avani- puratassi) Aug 16-Oct 15	Vatham Pitham	Vetrunilai Valarchi Thannilai valarchi
2	Koothirkaalam (Iypassi-karthigai) Oct 16-Dec 15	Vatham Pitham	Thannilai Valarchi Vetrunilai valarchi
3	Munpani Kaalam (Markazhi - Thai) Dec 16- Feb 15	Pitham	Thannilai Adaithal
4	Pinpani Kaalam (Maasi - panguni) Feb 16-Apr 15	Kapham	Thanilai Valarchi
5	Elavenil Kaalam (Chithirai - Vaikasi)	Kapham	Vetrunilai Valarchi
6	Mudhuvenil Kaalam (Aani- Aadi) June 16-Aug 15	Vatham	Thannilai Valarchi Thanilai adaithal

2.3.6.NOI KANIPPU VIVADHAM (DIFFERENTIAL DIAGNOSIS)

Some other types of vatha disease are mentioned in different text books.It was more helpful in differential diagnosis of ceghana vathm

1. PANIKAMBA VATHAM

மார்க்கமாய் வாயுவுவாய் மெய்நி றைந்து
வயிறுதனிற் பசியிலா தூணு மற்று
நார்க்கமாய் ஞாலத்து நடக்கை யற்று
நடுக்கமாங் கையிரண்டுந் திமிரு முண்டாம்

ஊர்க்கமா யுறக்கமில்லா துணர்ச்சி யற்று
உதறியே சரீரமெங்கு முலர்ந்து காணும்
பார்க்கமாய் வாய்விட்டு அலத்த லாகும்
பாணிக்கம்ப வாதத்தின் பாங்கு தானே

- யூகி வைத்திய சிந்தாமணி 800
பா.எண்.266, ப.எண். 101

Clinical features are,

1. Anorexia
2. Tingling sensation and numbness of upper limbs
3. Tremor of upper limbs
4. Sleeplessness and dryness all over the body.

2. KANDA KIRAGA VATHAM:-

The Clinical features are,

"வகையான குரலதனைப் பற்றி நொந்து
மாரோடு பிடரியினில் வலியுண்டாகி
நுகரான சரீரமெல்லாம் நொந்த ழற்றி
துணுக்கமாய்ச் சுவாசமது புறப்ப டாமல்
முகையான நாவாதே மூச்சு மாறி
முகத்திலே வியர்வையாகி விலாநோ வுண்டாம்
பகையான வன்னத்தைப் பருகொட்டாது
பரிகண்ட கிரகத்தின் பண்பு தானே"

- யூகி வைத்திய சிந்தாமணி 800
பா.எண்.303, ப.எண். 116

1. Pain in the throat, chest and occipital bone.
2. Anorexia
3. Breathing through month
4. Backache
5. Perfuse sweating on face
6. Loss of appetite

3. SIRAKAMBA VATHAM

பெற்றியாம் பெருமையாங் காலுங் கையும்
பெருவயிறு நெஞ்சோடு விரலு மூக்கும்
எற்றியா மெறிகழுத்து மெங்கும் பற்றி
ஏக்கமாய் நொந்துவுடம் பெங்கும் வீங்கி
உற்றியா மூணவேநி மிர்த்தெடுத்து
உறுதியாய் பிடிக்கவு மொணாமலாகும்
சத்தியாய் வாய்கசந்து மயக்க மாகும்
தரித்திட வொண்ணாது பேய் வாதந் தானே

- யூகி வைத்திய சிந்தாமணி 800
பா.எண்.276, ப.எண். 105

The Clinical features of Sirakambavathm are,

1. Stiffness of neck
2. Deafness
3. Yawning
4. Over Sleeping
5. Titubation in the head
6. Difficulty in using upper and lower limbs.

4. PEIVATHAM

பெற்றியாம் பெருமையாங் காலுங் கையும்
பெருவயிறு நெஞ்சோடு விரலு மூக்கும்
எற்றியா மெறிகழுத்து மெங்கும் பற்றி
ஏக்கமாய் நொந்துவுடம் பெங்கும் வீங்கி
உற்றியா மூணவேநி மிர்த்தெடுத்து
உறுதியாய் பிடிக்கவு மொணாமலாகும்
சத்தியாய் வாய்கசந்து மயக்க மாகும்
தரித்திட வொண்ணாது பேய் வாதந் தானே

- யூகி வைத்திய சிந்தாமணி 800
பா.எண்.276, ப.எண். 105

The Clinical features are

1. Pain and swelling in neck, upper and lower limbs
2. Weakness of hand muscles,
3. Vomiting
4. Giddiness
5. Swelling all over the body

2.3.7.KAAPPU (PREVENTION)

To Prevent *Cegana Vatham,* Avoid intake of excess sour, astringent and bitter taste foods and Sleep without pillows,to avoid holding neck in one position for a long period.

1. Kaappu - Prevention
2. Neekam - Treatment
3. Niraivu - Restoration

2.3.8.NOI NEEKAM (TREATMENT)

The fundamental of siddha treatment is not only for the removal of physical illness, but also cured the mental illness. Treatment is considered with prevention and improvement of the general body condition. So ,it essential to know the disease the etiological factor, the nature of the patient, the severity of illness, the seasons and the time of the occurrence of the disease.It was noted in following lines are,

Noi neekam is based on,

1. To bring the three dhosas in equilbrium
2. Treatment of the disease by internal medicine
3. Diet and advice
4. Thokkanam
5. Yoga
6. Kanma nevarthi
7. Bring the dhosa in Equilibrium

"நோய்நாடி நோய்முதல் நாடி அது தணிக்கும்
வாய்நாடி வாய்ப்பச் செயல;"

“உற்றானளவும் பிணியளவுங் காலமுங்
கற்றான் கருதிச் செயல;” - திருக்குறள்

The Siddha system of medicine is based on the mukkutra theory the treatment is mainly aimed to bring down the three dhosas to its equilibrium state and therby restoring the physiological condition of various thathukkal.

“முப்பிணி மருவி முறிவு கொள் குறிப்பை
தப்பாதறியும் தன்மையும் வாதபித்த வையப்
பிரிவையு மனைவதாம்
ஏறி யிறங்கி இணைந்து கலந்து
மாறி மாறி வருஞ் செய்கையாற் பிணி
நோ்மையறிந்து நீட்டு மருந்தே
சீரியதாமெனச் செப்புவர்”

Line of Treatment

The vitiation of vatham is a prime factor of Cegana Vatham .Purgation is the first line of treatment in vatha diseases. This can be explained in Siddha Maruthuvanka churukkam.

“விரேசனத்தால் வாதம் தாழும்
அறிந்திடும் வாதம் அடங்கு மலத்தினில்

சித்த மருத்துவாங்க சுருக்கம்.

Internal Medicine:

Appalakara chooranam - 2gm, twice daily after food with water is cured ceganavatham,it was mentioned in Gunapadam thathu jeeva vaguppu text book, Page no 368.

General Characteristics (பொதுக்குணம்)

குடல்வாதஞ் சூலை கொடிதான வாதம்
அடல்புரியு மைய மடுக்கும் - நெடுவயிற்றின்
உப்புசக்தி னோட உயர்குன்ம நோயகற்று
மப்பளக் கார மது

DIET

Pathiyam

"பத்தியத்தா லுண்டாகும் பண்டிதற்குப் பேராண்மை
பத்தியத்தா லுண்டாகும் பாண்டிதங்கள் - பத்தியத்தை
விட்டாத பிணிவகைகள் வித்தரிக்கும் விட்டிடவை
விட்டாற் பறக்கும் வினை"

- தேரையர் வெண்பா (ப.எண்:342)

In Theriyar venba was explained that the treatment as well as diet regimen was advised in vatha diseases (cehanavatham).

Vatha Roga Pathiyam

"புளிதுவர் விஞ்சுங் கறியாற் பூரிக்கும் வாதம்"

- பதார்த்த குண சிந்தாமணி

According to Pathartha chinthamani book is adviced the following tastes are avoid the Cegana Vatham (sour and astringent).

Vatha roga vasthukal:-

Root of lily water (pontederia veginalis) costus root (costus speciosus), honey colleted on branches of trees, black pepper (piper nigrum) gingely oil, asofoetida, leaves of clerodendron phlomoides, castor oil, black gram will cure vatha disease.

"செங்கழுநீர் கோட்டந்தேன் மிளகு நல்லெண்ணெய்
தங்கு பெருங்காயந் தழுதாழை - யெங்கெங்குங்
கூட்டு சிறு முத்துநெய் தோதிலுழுந்திவைகள்
வாட்டு மணிலத்தை மதி"

பதார்த்த குண சிந்தாமணி(ப.எண்.375)

THOKKANAM (MASSAGE THERAPHY)

தொக்கணம் - தொக்கு + அணம்

Thokku means skin.Anam means support/tones/heat

Thokkanam act as directly on vascular, nervous, lymphatic and musculo skeletal system. It was helped to strengthening the physical and mental state. It also increases the vital power and provides relaxation.

"தொக்கணத்தினா லிரத்தந் தோல் ஊனிவை கட்கு
மிக்க சவுக்கியஞ் சமீரனும் போ - மெய்கதிக
புட்டியுறக்கம் புணர்ச்சி யிவை கதிக்கும்
பட்ட அலைச்ச லறும் பா;".

- பதார்த்த குண சிந்தாமணி

Vatha diseases are relieved expecially by thokkanam.According to Theriyar maha karisal,

"மர்தனமாகிய தொக்கணத்தின் செயல் வகுப்பானே - சதா
நித்தமும் வாதம் பிணித்த பிணிப்பை செப்பேனே".

- தேரையர் மகா கரிசல்

TYPES

- Thattal - Patting
- Irukkal - Tightening
- Pidithal - Holding
- Murukkal - Twisting
- Kattal - Typing
- Azhuthal - Pressing
- Ezhuthal - Pulling
- Mallathal - Supinating
- Asaithal - Shaking .

YOGA THERAPY

- To unite the mind and soul.
- Therapeutic yoga is basically system of self treatment.
- Yogasanam are reliable supportive therapy or sometimes play the main part of the treatment of vatha diseases.
- The yogasanams are useful to not only revive the body but also strengthen the nervous, locomotor, digestive and endocrine systems.

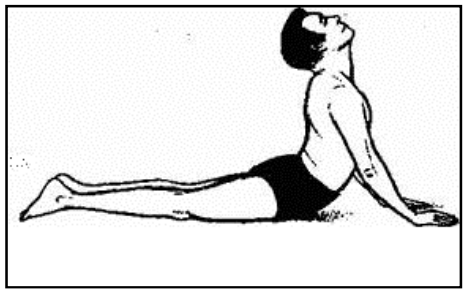
Asanam

Asanas are postures, which are performed by the physical body with the involvement of breath the mind, the intelligence, and these asanas help in balancing and harmonizing the basic structure of the human body.Our siddhars were well aware of the importance of the spine in relation to disease. Hence, they explained many asanas and postures, which were designed to make the spine more flexible and strengthen the neck muscles.

The following asanas are advice to the patients to releive from the symptoms of Cegana Vatham .

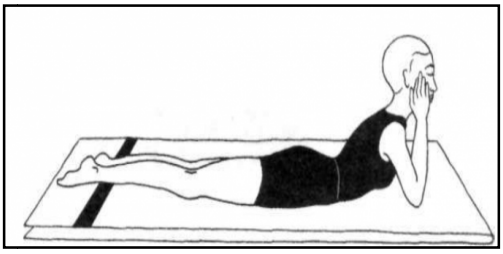
1. Bhujankaasana

- Helps in keeping the dorsal spine elastic and strong.
- Backache due to over strain can be releived.
- Helps in considerable reduction of abdominal fat.



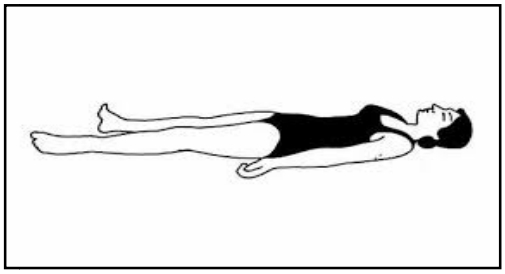
2. Maharasana

- It gives complete relaxation to the muscles and is useful in Hypertension, Insomnia etc.



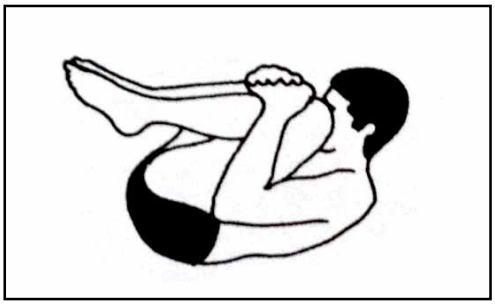
3. Savasana

- These asanas can be done after the neck pain is reduced considerably with drug treatment.



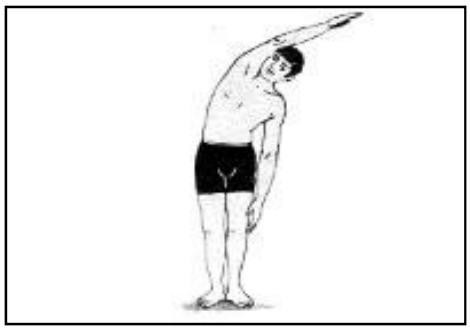
4. Pavanomukthasana

- To get relief from constipation and stengthan the abdominal muscles.



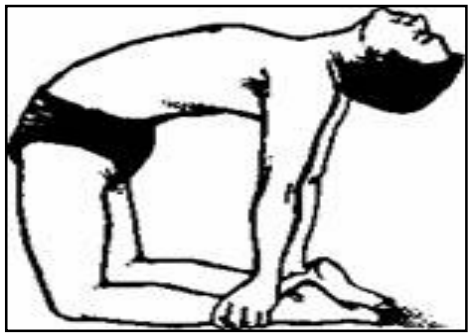
5.Arthakadi Chakkarasana

- It gives a good lateral movement to the vertebral column and helps in keeping it flexible and strenthan the para spinal muscles.



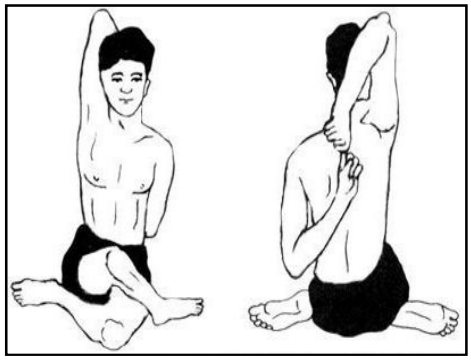
6.Ustrasana (The camel pose)

- Promotes spinal circulation
- Relieves vertebral pressure



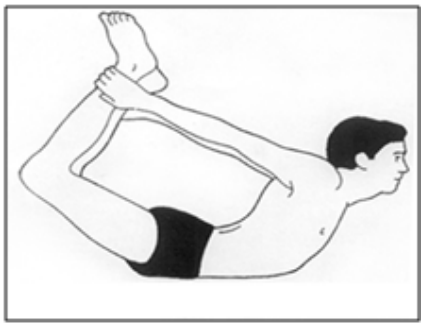
7.Gomukhasana (Cow face pose)

- This helps is making the spine straight
- It gives exercise to the lungs automatically.



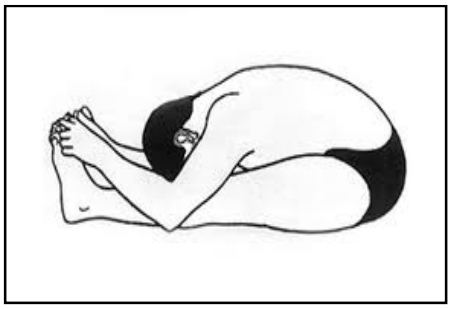
8.Dhanurasana (The Bow Curve pose)

- It makes spine and back muscles flexible and removes nervous weakness.
- It helps in removing constipation and pitha disorders.
- These asanas is contra indication to lumbar spondylitis and intra vertebral disc prolapse.



9.Patchimuttasana

- Stretches the back and spine
- Stretches the shoulder and strengthen to respirotary muscles.



The above mentioned are indicated to strenghthen the para spinal muscle and increased the motion of the vertebrae.

2.4.MODERN ASPECT - CERVICAL SPONDYLOSIS

2.4.1.ANATOMY OF VERTEBRAL COLUMN

The vertebral column forms back bone of the body. It is made up of 33 pieces of vertebrae and intervening intervertebral disc. The vertebral column, which lodges and protects the spinal cord, its meninges in a canal within it is called as vertebral canal. It is 60-70 cm length. It supports the body weight and transmits it to the ground through the lower limbs.

The Curvatures of the spine:

There are four curvatures in the vertebral column. They are two primary and secondary curvatures.The primary curvatures are the thoracic and sacral. They are convex posteriorly.The secondary curvatures are the cervical and lumbar. They are anteriorly convex.

The cervical curvature becomes prominent when the child is able to hold its head up and fit upright. The lumbar curvature appears by 12-18 months after the child starts walking. A slight lateral curvature is seen in the upper thoracic region.

Cervical vertebrae:

- The cervical vertebrae are the back bone of the neck. The cervical segment of vertebral column contains 7 vertebrae.
- The first second and the seventh are atypical and the third to sixth are typical.
- They are smaller and delicate than the thoracic and lumbar vertebrae.
- All the cervical vertebrae have a foramen in the transverse process known as foramen transversarium. This is identical to the cervical vertebrae.

  I - Cervical Vertebrae is called atlas.

  II - Cervical Vertebrae is called axis.

  VII - Cervical Vertebrae is called Vertebral prominence.
- Intervertebral disc is located between C2-C7. Atlas and Axis vertebrae has no disc between them. At birth the disc occupy half the length of the cervical spine. In adults the length is one-third of the cervical spine and after the age of 50 years it is reduced.

Palpable parts of cervical vertebrae:

I. The transverse process of C1 through the anterior border of sterno cleidomastoid immediately below the tip of the mastoid process.

II. The spine of C2 is in the nape of the neck 5cm below the external occipital protuberance.

III. The spine of C7 Where the collor bone crosses the posterior medium line of the neck.

Movements:

Flexion, Extension, lateral bending.

Movements of the Vertebral column:

The greater thickness of the disc in the cervical region compared with thoracic region is associated with the greater individual range of movements occurring in those regions.

Flexion, Extension, lateral flexion and rotation are possible in vertebral column. The following neck muscles are involved in neck movements.

Movements	Muscles	Nerve Supply
Flexion	Sternocleidomastoid	Accessory ventral rami of cervical spinal nerves C2, C3, C4
	Longus Capitis	Cervical Ventral rami C1-C3
	Longus coli	Cervical ventral rami C2-C6
	Rectus Capitis anterior	C1 Ventral Ramus
Extension	Trapezius	Accessory Nerve
	Erector spinae	Dorsal rami
	Rectus capitis posterior major and minor	Dorsal Rami C1
	Oblique capitis superior	C1 – Dorsal ramus

Lateral flexion and rotation	Scalene	Cervical ventral rami C3-C8
	Sternocleidomastoid	Acessory, ventral rami of cervical spinal nerves C2,C3,C4.
	Rectus Capitis	C1 – ventral ramus
	Splenius	Cervical dorsal ramus.
	Longus coli	Cervical ventral rami C3-C8
	Levator scapulae	Cervical ventral rami C3,C4,C5
	Longismus obliques capitis superior and inferior	C1 Dorsal ramus

2.4.2.DEFINITION

Cervical spondylosis is a disorder characterised by degeneration of the intervertebral disc, with subsequent changes in the bones and soft tissues. Spondylosis is usually asymptomatic. Symptoms are usually manifested of encroachment of local neural elements such as cervical nerve roots, spinal cord, vertebral artery (or) sympathetic nerves

2.4.3.EPIDEMIOLOGY

Cervical spondylosis is common condition that is estimated to account for 2% of all hospital admission.It is the most frequent cause of spinal cord dysfunction in patients older than 55 years.On the basis of radiologic findings ,90% of men older than 50 years and 90% of women older than 60 years have evidence of degenerative changes in the cervical spine.

Evidence from a 2009 report indicated that cervical spondylosis with myelopathy was the most common primary diagnosis (36%) among elderly us patients treatment of a degenerative cervical spine between 1992 and 2005.The study ,which looked at 156,820 hospital admissions for elderly medicare beneficiaries, also determined that fusion was the most common procedure (70%) performed in these patients for cervical spine degeneration , with 58% of the fusion being anterior.

International investigators in a study involving Ghanaians reported ,out of 225 patients who carried loads on their head ,143(63.6) had cervical spondylosis ,and of the 80 people who did not carry load on their head ,29(36%) had cervical spondylosis.

2.4.4.ETIOLOGY

A. Degenerative Causes

There are primary and secondary.

Primary – sensibility

- Genetic factors
- Metabolic factors
- Manual Labour

Secondary – Osteo arthritis

- Rheumatoid arthritis
- Metastatic carcinoma
- TB spine

B. Trauma:- Whiplash injury

- Road Traffic Accidents
- Atheletic injury

C. Hereditary factors:-

- Congenital narrowing of the cervical spinal canal.
- Segmental defets – Hemi vertebra, Fushed Vertebrae.

D. Acquired narrowing of cervical spinal canal due to

- Osteophytes
- Ossified posterior Longitudinal ligament.
- Facet joint hypertrophy (results foraminal stenosis and compression of root of radicular artery).
- Hypertrophied ligamentun flavum (compress the cord during extension).

2.4.5.PATHOGENESIS

Degenerative changes begins with intervertebral disc desiccation, which is associated with increase in the ratio of keratin sulfate to chondroitin sulfate. A long with desiccation, the nucleus pulposus shrinks, loses elasticity and becomes more fibrous due to the loss of water, protein and mucopolysaccharides during the aging process. Disc height is initially lost in the ventral portion of the disc, which results in a decrease in cervical lordosis. Unfortunately, this process results in positive feedback cycle due to the increase in forces applied ventrally and eventually may lead to kyphotic deformity.These early changes ultimately lead to the main pathophysiological process of cervical spondylosis, a reduction in sagittal spinal canal diameter. Additionally, these changes cause a transfer of axial load onto the facet joints, resulting in hypertrophy of those joints that further decreases the spinal canal's diameter.

The annulus fibrosis is thinner dorsally, thus making it easier for the nucleus pulposus to dissect through and cause disc herniations into the spinal canal. Preceding disc herniations, the peripheral fibers of the annulus fibrosis and sharpey's fibers dissect from the vertebral body edges.

Another early degenerative change is the posterior longitudinal ligament. Beginning to pull away from the vertebral bodies near the end plates. Eventually, abnormal cervical movement result either from the pain of disc herniation or annular protrusion, worsening degenerative changes or increased ligamentous laxity. Where the PLL peels off the dorsal vertebral body, reactive bone formation begins forming spondylotic bone spurs, which may be as large as the width of the vertebral body. These osteophytic growths may project into the intervertebral foramina. Some have reffered to these degenerative changes as cervical hyperostotic myelopathy. The increase in joint motion causes an acceleration of osteophyte growth, and this is most pronounced at C5-C6 and C6-C7.

As expected, these two levels are also the most often affected by spondylosis with C6-C7 affected more commonly than C5-C6. The growth of osteophytes, along

with degenerative changes, leads to decrease in sagittal spinal canal diameter, the main pathophysiological process in cervical spinal spondylosis.

In addition to the above described osteophytic and degenerative changes, a third modality that causes spinal canal narrowing is congenital cervical stenosis. The average cervical spondylotic patient's spinal canal is 3mm smaller than the average population. More pronounced narrowing is observed in congenital stenosis patients. The average adult spinal canal diameter has been reported to be 17 to 18mm between C3 and C7. These diameter patients will suffer from spondylosis and the range reported is 13-14.8mm. In patients with congential stenosis these degenerative changes are magnified leading to earlier onset of myelopathy.

2.4.6.CLINICAL FEATURES

1. Pain in the neck, radiating to the shoulder blades, top of the shoulders, upper arms and hands or back of the head.
    - Numbness and tingling sensation in the arms, hands and fingers, some loss of feeling in the hands and impairment of reflexes.
    - Crunching sounds with movement of the neck or shoulder muscles.
    - Neck stiffness
    - Headache
    - Muscle weakness and deterioration.
    - Dizziness and unsteady gait.

Common clinical syndromes associated with cervical spondylosis include the following:-

(i) Cervical radiculopathy

Compression of Cervical nerve roots leads to ischaemic changes that cause sensory dysfunction (Radicular pain) and motor dys function (weakness). Radiculopathy most commonly occurs in persons aged 40-50yrs. An acute herniated disc or chronic spondylotic changes can cause cervical radiculopathy and myelopathy. The C6 root is the most commonly affected one because of the predominant degeneration of the C5-C6 interspace. The next common sites are at C6-C7. There is also referred pain and tenderness along the medial border of the scapula.

(ii) Cervical myelopathy

It may be precipitated by a large central disc herniation but is more commonly the result of spondylotic changes superimposed on a congenitally narrowed canal. Dorsomedial herniation of disc and the development of transverse bony bars or posterior osteophytes may results alone or in combination with pressure on the spinal cord or the anterior spinal artery which supplies the anterior 2/3 of the cord.

It has an insidious onset, which typically becomes apparent in persons aged 50-60 years. Upper motor neuron signs develop in the limbs with spasticity of the legs. Sensory loss in the upper limbs is common. Tingling and numbness with progressive clumsiness.

THE SITE OF SENSORY DISTURBANCES WITH INDIVIDUAL ROOT

Nerve root	Dislevel	Symptoms
C3	C2-C3	Pain and numbness in the back of the neck mastoid process, and pinna of ear.
C4	C3-C4	Pain and numbness in the back of the neck, levator scapulae and anterior chest.
C5	C4-C5	Pain in the neck, Tip of the shoulder, anterior arm, numbness over middle of the body, deltoid muscle.
C6	C5-C6	Pain in the neck, shoulder, medial border of the scapula, lateral arm, dorsal forearm, numbness in tip of thumb or on dorsum of hand over first dorsal interosseus muscle.
C7	C6-C7	Pain in the neck, shoulder, medial border of scapula, lateral arm, dorsal forearm, sensory change in index and middle finger.
C8	C7-T1	Pain in the neck, medial border of scapula,medial aspects of arm and forearm. Sensory change in the ring and little fingers.

THE MOTOR SYMPTOMS AND SIGNS
(INCLUDING REFLEXES)

Nerve Root	Disc level	Weakness-Reflex change
C3	C2-C3	Not readily detectable weakness or reflex change except by EMG.
C4	C3-C4	Not readily detectable weakness or reflex change except by EMG.
C5	C4-C5	Weakness of extension of arm and shoulder particularly above 90^{o},wasting of deltoid muscle ,no reflex change.
C6	C5-C6	Weakness of biceps muscle, diminished triceps reflex.
C7	C6-C7	Weakness of triceps muscle, diminished triceps reflex.
C8	C7-T1	Weakness of triceps and small muscles of hand.No reflex change.

PHYSICAL EXAMINATION

The following signs are positive in cervical spondylosis.The signs are,

1. Spurling sign

Radicular pain is exacerbated by extension and lateral bending of the neck toward the side of the lesion. Which result in further foraminal compromise.

2. Lhermitte's sign

The generalized electric shock sensation is associated with neck extension.

3. Hoffman sign

Reflex contraction of the thumb and index finger occurs in response to nipping of the middle finger. This sign is evidence of an upper motor neuron lesion. A Hoffman sign may be insignificant if present bilaterally.

4. Axial compression test

Pain that is elicited by axial compression.

5. Shoulder abduction test

Relief of cervical radiculopathy by abduction.

6. Valsalva manouevre

Increase the radicular symptoms.

2.4.7.COMPLICATION

The following Complications is commonly occurred in untreated cases

1. Pseudo arthrosis
2. Graft displacement.
3. Neurological injury
4. Spastic gait
5. Quadriplegia
6. Injury to other structures.
    - Recurrent laryngeal Nerve.
    - Superior laryngeal Nerve.
    - Carotid artery.

2.4.8.DIFFERENTIAL DIAGNOSIS

1. Thoracic outlet syndrome

There is compression of lower trunk of brachial plexus by an anomalous band that connects the transerve process of C7 within the first rib. Neurologic deficit include weakness of intrinsic muscles of the hand and diminished sensation over the palmar aspect of fourth and fifth digits.

2. Brachial plexus and nerve injury

Pain from injury to the brachial plexus or peripheral nerves can be confused with pain of neck origin. Infiltration of peripheral nerves by neoplasm may occur in

lower trunk of brachial plexus and produce shoulder pain that radiates down the arm. There is numbness of the fourth and fifth fingers with weakness of intrinsic muscles of the hand supplied by ulnar and median

3. Refered pain

Cardiac ischemia causes left sided brachial neuralgia. In those patients, diagnosis depends on the history, examination and abnormal findings in ECG. Sub – diaphragmatic lesions cause right sided pain. The Gall bladder lesions cause right sided brachial neuralgia. The diagnosis depends upon the history examination and investigations.

4. Syringobulbia:

Dissociated sensory loss on the face, palatal palsy, Horner's syndrome, nystagmus, Kyphoscoliosis, pescavus and spina bifida are then found.

5. Syringomyelia:

Long history of neck and arm pain, depending on the site of the syrinx, ascending or descending spinal pathways may be affected which can lead to a spastic paraparesis or sensory deficit in the upper and lower extremities pressure on the anterior horn cells can lead to fasciculation and atrophy of the upper limb muscles.

In the lower extremities hyperflexia in the legs and extensor plantar responses are common. Charcot joint in the shoulders, elbows or knees are common in advances cases.

6. Tumours of the spinal canal

(a) Extra dural or epidural tumour

Commonest extra dural tumours are the spinal metastasis. The symptoms are local pain, radiating pain that is exacerbated by coughing; sneezing or straining pain and local tenderness often proceed.

(b) Intra dural Tumours:

(i) Intra medullary tumours:

Dissociated sensory loss in the segments of tumour origin and spring of posterior column sensory function. Later spinothalamic tracts may be involved. The sacral segments may be spared. Atrophy in the appropriate segments due to anterior horn cells involvement.

(ii) Extra medullary tumours: (Meningiomas neurofibroma)

Local back pain, sensory loss below the level of the pain, weakness and bladder and bowel dysfunctions.

7. Tabesdorsalis:

Fleeting and respetitive shooting pains occurring mostly in the legs. Loss of reflexes in the legs, impaired position and vibration sense gives severe ataxic gait. Romberg's test is positive. Aygyll Robertson pupils constitute a typical tabetic facies.

8. Epidural abscess:

This condition can occur as a complication of operation or lumbar puncture. Spinal osteomyelitis cause abscess formation Unexplained fever and mild spinalache, later radicular pain occurs. As the abscess expands it causes and compression with transverse and usually complete transaction syndrome.

2.4.9.INVESTIGATIONS:

1. **Plain – x ray of cervical spine antero posterior and lateral views.**
    - Intervertebral disc space narrowing
    - Osteophytic changes
    - Altered Lordosis
    - Degeneration in facet and vertebral joints.
    - Foraminal stenosis, central stenosis.
    - Sclerosis in the vertebrae.

2. CT – SCAN (Computerised Tomography)

- Confirms degenerative changes
- May demonstrate posterior osteophytes and disc herniation.

3. CT – MYELOGRAPHY:

- Useful for localisation of cord compression

4. MRI - (MAGNETIC RESONANCE IMAGING:

- To asses cervical canal diameter, to find out severity of the compression

5. EXAMINATION OF CSF

- Increased high protein.

2.4.10. TREATMENT AND MANAGEMENT:

1. Medication: a) Analgesic and muscle relaxant
   b) Corticosterone injection
2. Physiotheraphy : To relieve pain and enchance movement of the neck.
3. Conservative methods
4. Surgical management

(i) Cervical Traction:

Vertebral traction should be the first choice of pain relief for patients suffering nerve root pain. Intermittent sustained traction is carried out after careful positioning has localized the involved segment in such cases the treatment atleast once a day is essential prolonged pain relief will take several days to obtain.

Cervical traction provides positive patient response and can relieve the pain associated with certain neck disorders. It applies a stretch to muscles, ligaments and tissue components of the Cervical spine. It provides relief by promoting.

Seperation of the intervertebral joint space which contains the disc and may reduce a "bulge or impingement of structures for use in the foramen. It is not indicated for use in condition of instability such as with "Whiplash injury". It is most commonly used when the patient is in the supine position with the neck placed at 20^0-30^0 of flexion. Using traction in this position helps stretch the posterior neck muscles and facilitate intervertebral seperation, Which relieves pressure that may be pinching nerves, therefore promoting muscle relaxation and intervertebral separation.

(ii) Cervical collar/ Cervical Bracelet:

Cervical collar are advised to wear temporary collar for day time to restrict movement and a soft collar for support at night. A patient who is given a collar should be advised that the restriction in neck movement will alter other proprioception, for example he will need to take care in the dark or on entering darkened rooms when he may lose his balance. A patient wearing a collar should not drive because judgement of relative distance will be impaired. In the case of vertebrobasillar insufficiency cervical collar may be advised to the suffers according to the following exercises are advised in Cegana Vatham cases,

I. Neck Bending

- Sit with both legs straight.
- Place the palms on the floor by the side of the buttocks.
- Keep the back, neck and head straight.
- Close the eye

Stage - I (Forward - Back ward movement)

- Slowly move the head forward and try to touch the chin to chest.
- Then move the head as far back as comfortable.
- Try to feel the stretch of the muscles in front and back of the neck and the loosening of the spine in the neck.
- Practice 10 times.
- Inhale on the backward movement and exhale on the forward movement

Stage - II (Bending to Right and left)

- Close the eyes and face directly forward
- Slowly bend the head to the right and try to touch the right ear to the right shoulder.
- Bring the head back to the normal position.
- Then bend to the left side and try to touch the left ear to the left shoulder in the same fashion. Lift the head to the centre.
- This is one round practice 10 rounds
- Inhale on the upward movement and exhale on the downward movement.

Stage - III (Turning the head to Right and left)

- Keep the head upright and eyes closed.
- Gently turn the head to the right so that the chain is in line with the right shoulder.
- Slowly turn the head to the left through the centre till the chin is in line with the left shoulder. Bring the head to centre.
- This is one round practice 10 rounds.
- Inhale while turning to the front. Exhale while turning to sides.

Consider these follows

Move the head as far as comfortable. Do not strain.

- Keep the shoulders relaxed and unmoved.
- Feel the release of tension in the neck muscles and the shoulder muscles.

Benefits

- These exercise reduced neck pain,strengthen of the neck and shoulder muscles.

2. Neck Rotation

Stage - I (Half Rotation)

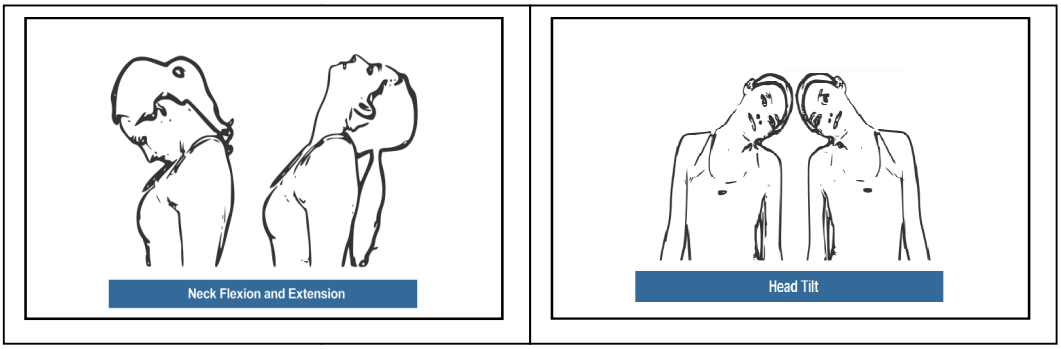
- Relax the head bending forward.
- Bring the right ear to the right shoulder in a circular way.

- Bring the left ear to the left shoulder in a Circular bending the head forward.
- Now relax the head forward again in a circular way and finally lift the head to normal position. This is one round.
- Repeat 10 rounds clock wise and 10 rounds anti - clock wise with breathing.

Stage II (Full rotation)

- Relax the head forward trying to touch the chin to the chest.
- Slowly rotate the head in as large a circle as possible, keeping the chin tucked in.

The diagrammatic presentation of neck exercises *(TOP 10)*



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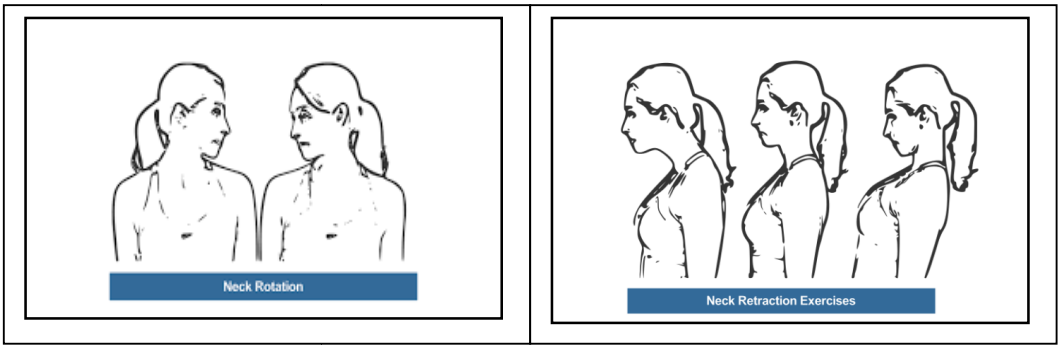

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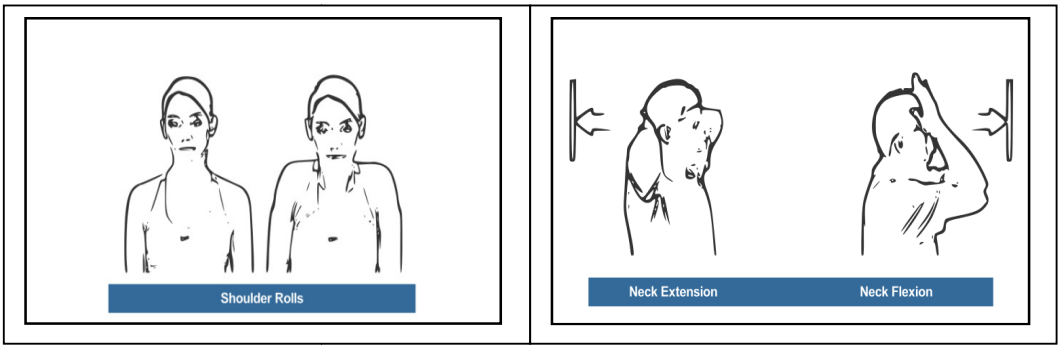

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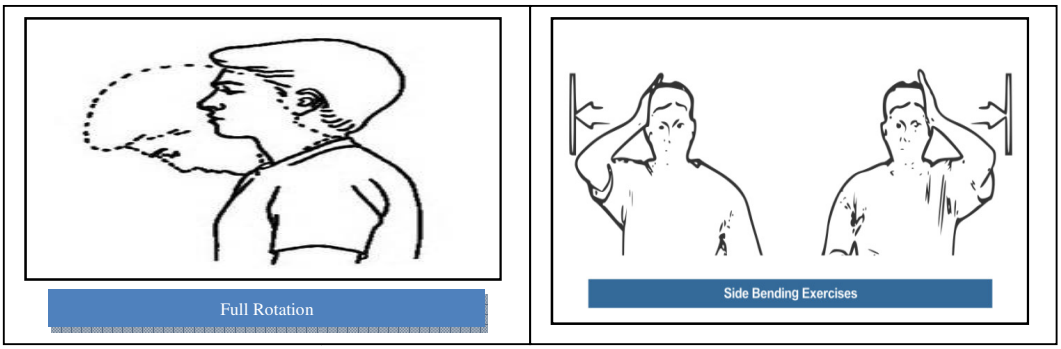
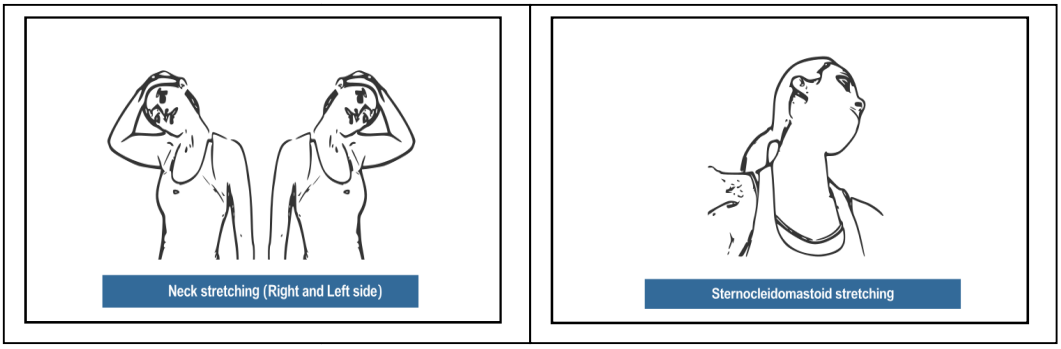


VII VIII



IX X

SUMMARY:

I. Neck Flexion and Extensions
II. Head Tilt
III. Neck Rotation
IV. Neck Retraction
V. Shoulder Rolls
VI. Neck Extension and Flexion
VII. Full Rotation
VIII. Side Bending
IX. Neck Stretching (Right and Left Side)
X. Sternocleidomastoid Stretching

CHAPTER -III

MATERIALS AND METHODS

3.1.STUDY AREA AND SETTING

The study period was covered from June 2017 to July 2019 at the Govt. Siddha Medical College and Hospital, Palayamkottai- 627 002, Tirunelveli, Tamil Nadu. Before starding this study was getting the permission from Indian Ethical Commitee.

3.2.STUDY DESIGN

The study design is a prospective open labelled Phase-II non randomized clinical trial of *Appalakara chooranam* in *Cegana Vatham* (Cervical spondylosis) study. The included selection were newly diagnosed and already known diagnosed cervical spodylosis patients with or without taking treatment. A written informed consent form was recruited in the study. The purpose of the study was explained to the patients before administration of trail drug. The patients Information, life style, anthropometric measurements and Siddha parameters were recorded.

The total number 40 patients, equally in both genter and age between 30 to 60 were included for this study. All selected patients were treated the trail drug for 30 days. All the relavant findings are recorded at end of the study period (30 days).

3.3.SELECTION OF THE DRUG

The *Appalakaram* (Sodium carbonate) is available in three types varieties,according to siddha text books was mentionend types of applakaram ,namely carbonates,subcarbonate of soda and soda carbonas impura(sodii carbonas impura).The *Applakkaram* was collected from Madurai siddha traditional medical shop. Applakaram was confirmed by siddha pharmacologist of PG Gunapaadam department in GSMC ,Palayamkottai and chemical authentication by Chemist, Department of chemisty, Sadakathullah Appa College,Tirunelveli.

3.4.SELECTION OF THE PATIENTS

The Clinical study on Cegana vadham was carried out in the post graduate department of Pothu Maruthuvam, Govt Siddha Medical College, Palayamkottai. In this study 20 patients were treated as Inpatients and the other 20 as Outpatients,totally 40 patients were taken from this study.

3.4.1.INCLUSION CRITERIA

- Age: 30 – 60 years
- Sex: Both Male and Female
- Willing to participate in trial and signing consent form by fulfilling the conditions of Proforma
- Neck pain radiating to upper limb with or without numbness, giddiness and neck stiffness
- Restriction neck movement
- Willing for doing laboratory investigations and X-Ray imaging.
- The neck disability index score should be equal or greater than 40%.

3.4.2.EXCLUSION CRITERIA

Cervical rib

- Trauma
- Systemic hypertension
- Diabetes mellitus
- Chronic kidney disease
- Tuberculosis in spine
- Ischaemic heart diseases
- Pregnancy and lactation
- Neoplasms
- Patients with any other serious systemic illnes
- Congenital anomalies of spine

The detailed history was taken from the patient about:

- Occupation
- Socioeconomic status
- Psychological condition
- Diet and other habits
- Trauma

3.4.3.Diagnosis:

The diagnosis was made by following siddha diagnostic methods are Nilam, Kaalam, Poriyalaridhal, Pulanalarithal, Vinaadhal, Mukkutra nilaigal, Udal Thathukal Nilai and Envagai Thervugal. Its correlated in modern medicine was cervical spondylosis. It is confirmed by the Radiological examinations (x-ray cervical spine (or) MRI and CTS.

Assesment of result:

The result were assessed on the basis of symptoms and Neck disability index scale .

Neck Disability Index:

- This questionnaire has been designed to give us information as to how your neck pain has affected your ability to manage in everyday life. Please answer every section and mark in each section only the one box that applies to you. The index score was recorded by separate working sheet **(Annexure)**

Score: /50 Transform to percentage score x 100 = %points

- **Scoring:** For each section the total possible score is 5: if the first statement is marked the section score = 0, if the last statement is marked it = 5. If all ten sections are
- completed the score is calculated as follows: Example:16 (total scored) 50 (total possible score) x 100 = 32%
- If one section is missed or not applicable the score is calculated: 16 (total scored) 45 (total possible score) x 100 = 35.5%

- Minimum Detectable Change (90% confidence): 5 points or 10 %points
- NDI developed by: Vernon, H. & Mior, S. (1991). The Neck Disability Index: A study of reliability and validity. Journal of Manipulative and Physiological Therapeutics. 14, 409-415

3.4.4.INVESTIGATIONS :

The following investigations were done in all selected patients in laboratory of Govt. Siddha Medical College, Palayamkottai,. and private laboratory.

Blood:

- Total WBC Count
- Differential WBC count
- Erythrocyte Sedimentation Rate
- Haemoglobin estimation
- Estimation of Sugar
- Estimation of creatinine
- Estimation of Urea
- Estimation of Cholesterol.

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Urine:

- Albumin
- Sugar
- Deposits

Radiological Investigations :

- X-Ray cervical spine (AP and Lateral View)

Other Investigation

- MRI –cervical spine (In selected cases)

3.5.TREATMENT AND MANAGEMENT

All the patients were treated with the following line of treatment.*Appalakara chooranam* -2 gm twice a day after food with water (internally) is given for 30 days till end of the trement period. All the patients were adviced to dietary regimen. Yogasana and exercise were adviced along with oral medicine.

3.5.1.Preparation of Trial Medicine (Annexure)

The mineral preparation of *Appalakara chooranam* have been selected from the Classical Siddha literature. ***Reference: GunapadamThathu Jeeva Vaguppu Pagam II&III Page No.368.***

3.5.2.Collection and authentication of Trial Medicine (Annexure)

The *Appalakara chooranam* was collected from the Nagarkovil & Madurai Siddha medical shop, Tamilnadu. The mineral will be identified and authenticated by the Chemist ,Sadakathullah Appa College and Gunapadam experts at Government Siddha College and Hospital, Palayamkottai,Tirunelveli - 627002.

Preclinical Analysis of Trial Medicine

All the preclinical studies of the study drug which have been included in Bio chemical and pharmacological studies and cross checked before starting the treatment.The Biochemical analysis were done in Dept. of Biochemistry, GSMCH, Palyamkottai. The pharmacological activities- Anti-Infllammatory, Analgesic,Anti ulcer, Acute and sub-acute toxicity, and Anti microbial activities were carried out in this study. studies were done in K.M. College of Pharmacy, Madurai -625107.

3.5.3.Ethical Review

The study was conducted in accordance with the ethical principles that are consistent with Good Clinical Practice guidelines and obtained prior approvals before start of the trial from the Institutional Ethics Committee of GSMCH, Palayamkottai (**GSMC-IV-IEC/2017/BR-I/06/29.05.2017**) and Institutional animal ethical committee (IAEC) of K.M. College of Pharmacy, Madurai (**TNMGRMU/KMCP/IEAC/22/2018**). The trial was applied and approved by the Clinical Trial Registry of India **[CTRI/2018/03/01268 (Registered on 20/03/2018) Trial Registered Prospectively]**.

3.5.4.Study Enrolment

Participants were informed in Tamil language, regarding the trial, the expected benefits and their right to opt-out of trial at any time without pre judice. Informed written consent was obtained from each participant, prior to his/her inclusion into the trial.

Before treatment the trial all the subjects were selected based on Neck Disability Index Score should be equal(or) greater than 40%. All subjects of age range between 30-60 years .

The subjects with history of serious adverse effects or hypersensitivity reactions to the medication such as rashes, diarrhoea, vomiting etc., and history of treatment with active liver disease or hepatic dysfunctions, higher serum creatinine (> 2.5 mg/dl) and serious or unstable medical or psychological condition are excluded from the study.

During the visit, body weight, blood pressure, cardiovascular,neurological and respiratory system were clinically recorded . During the treatment any adrverse reaction or side effects of patients, immediately to inform patient and pharmacovigilance committee. At the end of the study period, all the patients were instructed to follow diet control, regular exercise, yoga, meditation and bed rest to pursue the further treatment in the PG, Pothu Maruthuvam OP for the follow up study.

3.5.5.Statistical Analysis

All data were analysed using the SPSS 20.0 (IBM). Data were expressed as means and standard deviation. The significance of the difference between the means of the baseline and the final examinations was tested using the paired “t” test. A probability value of <0.05 was considered to be statistically significant.

CHAPTER - IV

RESULTS AND OBSERVATIONS

4.1.PRE CLINICAL STUDY

4.1.1.ANTI-INFLAMMATORY ACTIVITY

Evaluation of carrageenan induced Anti-inflammatory activity of Siddha formulation *Appalakara chooranam* in Albino wistar rats.

Table 1. Effect of siddha formulation *Appalakara chooranam*on Carrageenan Induced Rat Paw Edema.

Treatment	Dose (mg/kg, p.o.)	Mean inc rease in paw volume (ml)	% Decrease in paw volume
Normal control	10ml/kg saline	0.95 ± 0.08	-
Toxic control	0.1 ml, 1% carrageenan	3.30 ± 0.20*a	-
Standard control	10mg/kg Indomethacin	1.35 ± 0.10*b	59.09%
Treatment control	100mg/kg Appalakara chooranam	1.42 ± 0.15*b	56.96%
Treatment control	200mg/kg *Appalakara chooranam*	1.36 ± 0.12*b	58.78%

- Values are expressed as mean **±** SEM.
- Values were compared by using analysis of variance (ANOVA) followed by Newman-Keul's multiple range tests.
- * (a) Values are significantly different from normal control G1 at P<0.01.

* (b) Values are significantly different from Toxic control G2 at P<0.01.

Table 2. Effect of siddha formulation *Appalakara chooranam*on Carrageenan Induced Pleurisy in Rats.

Treatment	Dose (mg/kg, p.o.)	Pleural exudates (ml)	Leukocytes (×103 cells/ml)
Normal control	10ml/kg saline	0.11±0.03	0.35±0.02
Toxic control	0.1 ml, 1% carrageenan	0.37±0.10*a	4.18±0.34*a
Standard control	10mg/kg Indomethacin	0.13±0.04*b	0.45±0.05*b
Treatment control	100mg/kg *Appalakara chooranam*	0.20±0.07*b	0.52±0.07*b
Treatment control	200mg/kg *Appalakara chooranam*	0.14±0.05*b	0.50±0.05*b

- Values are expressed as mean ± SEM.
- Values were compared by using analysis of variance (ANOVA) followed by Newman-Keul's multiple range tests.
- * (a) Values are significantly different from normal control G1 at P<0.01.

  * (b) Values are significantly different from Toxic control G2 at P<0.01.

Anti-inflammatory Activity of siddha formulation *Appalakara chooranam*

The effect of **siddha formulation *Appalakara chooranam*** on carrageenan-induced edema in rats is shown in Table 1. The results obtained indicate that the **siddha formulation *Appalakara chooranam*** had significant anti-inflammatory activity in rats. The **siddha formulation *Appalakara chooranam***reduced the edema induced by carrageenan by 56.96% and 58.78% on oral administration of 100 and 200 mg/kg, as compared to the untreated control group.

Indomethacin at 10 mg/kg inhibited the edema volume by 59.09%. The effect of **siddha formulation *Appalakara chooranam*** on carrageenan-induced pleurisy in rats is shown in Table 2. The volume of pleural exudates in the toxic control group was 0.37±0.10 ml. Animals treated with the **siddha formulation *Appalakara chooranam*** (100 and 200 mg/kg, p.o.) decreased the pleural exudates to 0.20±0.07 ml and 0.14±0.05.Treatment with Indomethacin (10 mg/kg, p.o.) produced the exudates of 0.13±0.04 ml. The leukocyte count for the control group was found to be $4.18\pm0.34\times10^3$ cells/ml. Animals treated with the **siddha formulation *Appalakara chooranam*** and standard produced a leukocyte migration of $0.52\pm0.07\times10^3$,$0.50\pm0.05X10^3$ and $0.45\pm0.05\times10^3$ cells/ml, respectively.

DISCUSSION

Due to the increasing frequency of intake of NSAID's and their reported common side effects, there is need to focus on the scientific exploration of siddha formulation drugs having fewer side effects. So, there is a continuous search for indigenous drugs, which can provide relief to inflammation. Carrageenan induced inflammation is a biphasic phenomenon. The first phase of edema is attributed to release of histamine and 5-hydroxytryptamine. Plateau phase is maintained by kinin like substances and second accelerating phase of swelling is attributed to prostaglandin like substances. The knowledge of these mediators involved in different phases is important for interpreting mode of drug action.The tests performed with the **siddha formulation *Appalakara chooranam*** in the pleurisy model showed that the **siddha formulation *Appalakara chooranam*** behaves as an inhibitor of leukocyte migration and the formation of pleural exudates when given orally, as reported earlier. Thus it can be concluded that the **siddha formulation *Appalakara chooranam*** possess significant anti-inflammatory activity in rats. Further studies involving the purification of the prerpation and the investigations in the biochemical pathways may result in the development of a potent anti-inflammatory agent with a low toxicity and better therapeutic index.

4.1.2 ANALGESIC ACTIVITY

Evaluation of Analgesic Activity of Siddha formulation *Appalakara chooranam* in Animal Models

Analgesic activity

Acetic acid-induced writhing test

The acetic-acid writhing test was performed using the reported procedure Groups of rats (n=6), were administered with100 and 200 mg/Kg of siddha formulation *Appalakara chooranam*, 10 mg/Kg Diclofenac as positive control group and 1 mL distilled water as negative control group. After 30 minutes the animals were administered with i.p. injection of 0.1 mL acetic acid (0.6%). Then the count of abdominal contractions of animals during 30 minutes after acetic acid injection was reported and the Percentage Analgesic Activity (PAA) was calculated by using the following formula:

$$PAA = ((C- CD)/CD) \times 100$$

C = Mean of contractions' count in animals treated with different doses of siddha formulation *Appalakara chooranam* and Diclofenac sodium

CD = Mean of contractions' count in animals served as negative control Statistical analysis

The results are reported as mean ± S.E.M. The statistical analyses were performed using one way analysis of variance (ANOVA). Group differences were calculated by post hoc analysis using Tukey's test. For all tests, differences with values of $P<0.05$ were considered significant.

Results

Acetic acid-induced writhing response

The second study showed that the application of different doses of siddha formulation *Appalakara chooranam* had significant analgesic effects in the animals under investigation. The results of doses 100 and 200 mg/Kg were significant and comparable with the effect of Diclofenac sodium in analgesic activity (Table 1).

Table 1. Effects of siddha formulation *Appalakara chooranam* on acetic acid–induced writhing response (N=6 in each group).

Groups	Treatment	(number of writhing movements) (Mean ± S.E)	Percentage %
Group I	Distilled water	28.00 ± 2.40	-
Group II	Diclofenac sodium 10mg/kg	5.65 ± 0.85*b	79.82%
Group III	100mg/kg Appalakarachooranam	15.00 ± 1.60*b	46.42%
Group IV	200mg/kg *Appalakara chooranam*	13.05 ± 1.25*b	53.39%

- Values are expressed as mean **±** SEM.

  * (b) Values are significantly different from Toxic control G2 at P<0.01.

Discussion and conclusion

The analgesic activity was assessed by writhing test which has been reported to be useful for investigation of peripheral antinociceptive activity and performed as a chemical pain model . The siddha formulation *Appalakara chooranam* demonstrated a dose-dependent, significant antinociceptive activity in animal models of pain. Acetic acid believed to increase the PGE2 and PGF2α in peritoneal fluid . The analgesic activity shown in models of pain is indicative that siddha formulation *Appalakara chooranam* might possess centrally and peripherally mediated antinociceptive properties.

Chemical components of siddha formulation *Appalakara chooranam* such as flavonoids, saponins or phenolic compounds may be responsible for the antinociceptive activities of this formulation. Since the findings of this study revealed a significant analgesic effect of the siddha formulation *Appalakara chooranam*, it can be concluded that terpenoids and specially saponins of siddha formulation *Appalakara chooranam* may be responsible for the observed analgesic effect which should be proved by further investigations.

It can be concluded that possesses anti-nociceptive properties which are probably mediated via inhibition of prostaglandin synthesis as well as central inhibitory mechanisms which may be of potential benefit for the management of pain and inflammatory disorders.

4.1.3. ANTI ULCER ACTIVITY

EXPERIMENTAL DESIGN

GROUP NO	TREATMENT	DRUG /DOSE
Group-I	NORMAL CONTROL	CMC 1% (1ml)
Group-II	ULCER CONTROL	ASA 200mg/ kg
Group-III	STANDARD CONTROL	OMEPRAZOLE 2mg /kg (Half hour before ASA administration)
Group-IV	TREATMENT CONTROL	*Appalakara chooranam*100mg/kg orally (Half hr before ASA administration)
Group-V	TREATMENT CONTROL	*Appalakara chooranam* 200mg/kg orally (Half hr before ASA administration)

ASPIRIN INDUCED &PYLORIC LIGATION ULCER MODEL

The albino rats were divided in to five groups, each group contains six animals. The study was carried out for four days after administration of the treated dose 30 min after ,the rats were treated with aspirin 200mg /kg. This process was carried out for three days, on the third day after administration of drug the rats were subjected to fasting. On the next day pyloric ligation was made. The rats were sacrificed four hrs later by cervical dislocation and the esophagi were clamped ,the stomach was exposed carefully , opened along the greater curvature , the luminal contents were removed , the total volume of gastric secretion , total acidity, free acidity were estimated by titration method.

The ulcer index was calculated according to the method of gangrly and Bhatnagar[4].the lesions were counted with the aid of hand lens (10x) and each gives a severity rating as follows.

ULCER SCORE	DESCRIPTIVE OBSERVATION
0	Normal colored stomach
0.5	Red coloration
1	Spot ulcers
1.5	Haemorrhagic streak
2	Ulcers
3	Perforation

Mean ulcer score for each animal was expressed as ulcer index. The percentage of ulcer inhibition was determined as follows

Protection of ulcer (%) = $\frac{\text{Control mean ulcer index- test mean ulcer index}}{\text{Control mean ulcer index}} \times 100$

values are expressed as MEAN ± SEM ,values were find out by using one way ANOVA followed by Newman kevel's multiple range test , probability value < p.0.01 was considered significant.

ANTIULCER ACTIVITY OF SIDDHA FORMULATION *APPALAKARA CHOORANAM*

TABLE NO - 1

Group	Treatment	Dose mg/kg	Total volume of gastric secretion (ml/100 gm)	Total acidity (meq/l/ 100g)	PH	Ulcer score	% prote -ction
I	Normal control	1 ml of 1%cmc	3.8± 0.60	422.50± 21.55	2.1± 0.18	0.28± 0.01	0.000
II	Ulcer control	200mg/kg ASA	5.4± 0.80*a	492.52± *a 24.20	1.3±*a 0.18	2.1±*a 0.15	0.000

III	Standard control	2mg/kg omeprazole	2.6± 0.28	328.80± 15.20	4.2± 0.56	0.52± 0.05	75.23
IV	Treatment control	*Appalakara chooranam* 100mg/kg	3.1± 0.30*b	380.5±*b 18.25	3.1±*b 0.30	0.82± *b 0.09	60.95
V	Treatment control	*Appalakara chooranam* 200mg/kg	3.0± 0.32*b	362.5±*b 16.00	2.6±*b 0.26	0.72± *b 0.10	65.71

*Values are expressed as Mean**± SEM**

***a – Values are significantly different from Normal control group at P<0.01**

***b -- Values are significantly different from ulcer control group at P<0.01**

RESULTS

Administration of 200 mg/kg ASA suspension intragastrically consistently caused hemorrhagic lesions in the mucosa of the glandular stomach, indicating true ulcer formation as stated in histological findings. Pretreatment of rats with siddha formulation *Appalakara chooranam* through orally at 100 and 200mg/kg prevented gastric ulcerogenesis significantly. But it's seemed to be less efficient than standard drug like omeprazole.

4.1.4.(a). Acute toxicity study of *Appalakara chooranam*

The acute toxicity of *Appalakara chooranam*was evaluated using OECD- 423 guidelines. There was no mortality or morbidity observed in animals through the 15-days period following single oral administration at all selected dose levels of the *Appalakara chooranam*(Table-1). The animals did not show any changes in the general appearance during the observation period. Morphological characteristics such as fur, skin, eyes and nose appeared normal. No tremors, convulsion, salivation, diarrhea, lethargy or unusual behaviors such as self mutilation, walking backward and so forth were observed. Gait and posture, reactivity to handling or sensory stimuli, grip strength was also normal.

Table.1

Groups	Dose ($mg.kg^{-1}$)	Sign of Toxicity ($ST.NB^{-1}$)	Mortality ($D.S^{-1}$)
Group I	0	0/3	0/3
Group II	300	0/3	0/3
Group III	2000	0/3	0/3

Table.1. Acute toxicity study of *Appalakara chooranam*on experimental mice. The acute toxicity of *Appalakara chooranam*on experimental mice was tested using OECD-423 guidelines, where ST- sign of toxicity; NB- normal behaviour; D- died; S- survive. Values are expressed as number of animals (n=3).

4.1.4(b).Effect of *Appalakara chooranam* in Sub acuteToxicity

*Appalakara chooranam*were evaluated for sub acute toxicity.

Effect of *Appalakara chooranam*on body weight changes in rats

The effect of *Appalakara chooranam*was observed for their effect on the body weight changes from the study it was observed that, there was significant increase ($p<0.05$) in body weight in all the animals observed. The results are shown in Table.2.

Table.2

Treatment	Day 1	Day 5	Day 10	Day 20
Control	180.15±6.8	191.45 ±6.20	199.15 ±6.35	199.7±6.58
Appalakara chooranam **50 $mg.kg^{-1}$**	187.30 ±6.4	196.30 ±6.30	201.25 ±6.70	201.30±6.72*
Appalakara chooranam **100 $mg.kg^{-1}$**	179.35 ±5.7	192.30 ±6.40	199.55 ±7.10	200.36±6.30*
Appalakara chooranam **200 $mg.kg^{-1}$**	188.30 ±7.2	200.15±6.50	201.90 ±7.20**	209.45±7.26**
Appalakara chooranam **400 $mg.kg^{-1}$**	180.65 ±6.05	195.15 ±5.60	198.60 ±6.35**	300.66±7.38**

Table.2.The effects of ***Appalakara chooranam***on body weight changes in rats. A study on the effects of ***Appalakara chooranam***on body weight changes in rats was carried out.. where, group I animals (GPI) were treated with normal saline (5 $ml.kg^{-1}$), group II animals (GPII) with 50 $mg.kg^{-1}$ of ***Appalakara chooranam***, group III animals (GPIII) with 100 $mg.kg^{-1}$ of ***Appalakara chooranam***, group IV animals (GPIV) with 200 $mg.kg^{-1}$ of ***Appalakara chooranam***, group V animals (GPV) with 400 $mg.kg^{-1}$ ***Appalakara chooranam***. The values are expressed as mean ± S.E.M. n=6. The results of group I were compared with other groups such as II, III, IV, and V. The statistical analysis was carried out using one way ANOVA method, where **P<0.01 *P<0.05.

Effect of *Appalakara chooranam*on kidney, heart, liver and brain in rats

The effects of ***Appalakara chooranam***on kidney, heart, liver and brain of the rats were observed. From the study it was clear that, significant (p<0.01) changes in the weights of various organs of the animals occurred with higher doses of the extract (400 $mg.kg^{-1}$ bwt), but macroscopic examinations did not show any changes in colour of the organs of the treated animals compared with the control. The results are shown in Table.3.

Table.3

Treatment	Heart (gms)	Kidney (gms)	Liver (gms)	Brain (gms)
Control	0.32 ± 0.05	0.66± 0.03	3.35± 0.05	0.70± 0.05
Appalakara chooranam@50 $mg.kg^{-1}$	0.33± 0.02	0.82± 0.03	3.47± 0.03	0.73± 0.3
Appalakara chooranam@100 $mg.kg^{-1}$	0.34± 0.06	0.80± 0.04	3.39±0.02	0.71± 0.2
Appalakara chooranam@ 200 $mg.kg^{-1}$	0.33± 0.04	0.75± 0.02	3.37± 0.02	0.78± 0.05
Appalakara chooranam@400 $mg.kg^{-1}$	0.32± 0.03	0.76± 0.03	3.40± 0.03	0.80± 0.05

Table.3.The effects of ***Appalakara chooranam***on kidney, heart, liver and brain of the rats. A study on the effects of ***Appalakara chooranam***on kidney, heart, liver and brain of the rats was tested. where, group I animals (GPI) treated with normal saline (5 ml.kg^{-1}), group II animals (GPII) with 50 mg.kg^{-1} of ***Appalakara chooranam***, group III animals (GPIII) with 100 mg.kg^{-1} of ***Appalakara chooranam***, group IV animals (GPIV) with 200 mg.kg^{-1} of ***Appalakara chooranam***, group V animals (GPV) with 400 mg.kg^{-1} ***Appalakara chooranam***. The values are expressed as mean ± S.E.M. n=6. The results of group I were compared with other groups such as II, III, IV, and V. The statistical analysis was carried out using one way ANOVA method, where **P<0.01.

Effect of *Appalakara chooranam* on biochemical profiles of rats

The effect of ***Appalakara chooranam***on various biochemical parameters of the experimental animal 'rats' were tested. From the study it was evident that, there was significant decrease (p<0.05) in the plasma glucose level in treated rats especially at higher dose (400 mg.kg^{-1}) compared with control rats. The control rats were administered only with 5 ml of normal saline. Significant decrease (p<0.05) in the plasma total cholesterol (TC), triglyceride (TG) and LDL-cholesterol levels were observed. But a significant increase (p<0.05) in HDL-cholesterol levels were observed in all the treated animals compared with the control animals. AST, ALT and ALP levels were also normal in the ***Appalakara chooranam***treated animals. From the results of biochemical study there was no evidence of severe toxicity associated with the administration of higher concentration of ***Appalakara chooranam***. The results are shown in Table.4.

Table.4

Treatment	**Glucose (mg.dl^{-1})**	**Cholesterol (mg.dl^{-1})**	**Triglyceride (mg.dl^{-1})**	**HDL (mg.dl^{-1})**	**LDL (mg.dl^{-1})**
Control	90.65± 0.62	39.62± 0.56	28.25± 0.45	139.25± 0.55	83.15±1.72
Appalakara chooranam @50 mg.kg^{-1}	88.50± 0.56	25.85± 0.25*	13.22± 0.23*	179.28± 0.65*	70.59±1.28
Appalakara chooranam @100 mg.kg^{-1}	85.45± 0.47	26.74± 0.26*	15.42± 0.28*	169.18±0.78*	68.84±1.10

Appalakara chooranam @200 mg.kg^{-1}	86.25± 0.55**	33.18± 0.30	17.84± 0.38*	188.30± 0.84*	47.60±1.30
Appalakara chooranam @400 mg.kg^{-1}	82.25± 0.45**	32.78± 0.28	19.28± 0.34*	186.2± 0.85*	45.50±0.84

Table.4.The effect of ***Appalakara chooranam***on biochemical parameters such as glucose, cholesterol, triglyceride, HDL and LDL. A study on the effect of ***Appalakara chooranam***on biochemical parameters such as glucose, cholesterol, triglyceride, HDL and LDL in rats was tested.where, group I animals (GPI) treated with normal saline (5 ml.kg^{-1}), group II animals (GPII) with 50 mg.kg^{-1} of ***Appalakara chooranam***, group III animals (GPIII) with 100 mg.kg^{-1} of ***Appalakara chooranam***, group IV animals (GPIV) with 200 mg.kg^{-1} of, group V animals (GPV) with 400 mg.kg^{-1} ***Appalakara chooranam***. The values are expressed as mean ± S.E.M. n=6. The results of group I were compared with other groups such as II, III, IV, and V. The statistical analysis was carried out using one way ANOVA method, where **P<0.01 *P<0.05

Table.5

Treatment	**AST (IU.l^{-1})**	**ALT (IU.l^{-1})**	**ALP (IU.l^{-1})**	**TP (g.l^{-1})**	**ALBUMIN (g.l^{-1})**
Control	321.5±12.40	74.5± 3.18	256.58± 8.80	72.85± 3.32	40.15±2.35
Appalakara chooranam @50 mg.kg^{-1}	310.0±9.50**	72.5± 2.20**	269.10± 2.75**	73.30± 2.32	37.30±2.65
Appalakara chooranam @100 mg.kg^{-1}	311.3±7.20**	70.1± 3.15**	263.18± 6.70**	83.15± 2.82	39.30±3.05
Appalakara chooranam @200 mg.kg^{-1}	306.4±7.95	65.4± 2.90	268.00± 5.20	72.25± 3.32	41.20±2.75
Appalakara chooranam @400 mg.kg^{-1}	316.2± 8.20	67.3± 3.52	272.40± 4.40	77.05± 2.58	40.48±2.70

Table.5.The effects of ***Appalakara chooranam***on biochemical parameters such as AST, ALT, ALP, TP and Albumin in rats. A study on the effects of ***Appalakara chooranam***on biochemical parameters such as AST, ALT, ALP, TP and Albumin rats was tested. where, group I animals (GPI) were treated with normal saline (5ml.kg^{-1}), group II animals (GPII) with 50 mg.kg^{-1} of HAEBD group III animals (GPIII) with 100 mg.kg^{-1} of ***Appalakara chooranam***, group IV animals (GPIV) with 200 mg.kg^{-1} of ***Appalakara chooranam***, and group V animals (GPV) with 400 mg.kg^{-1} ***Appalakara chooranam*** The values are expressed as mean ± S.E.M. n=6. The results of group I were compared with other groups such as II, III, IV, and V. The statistical analysis was carried out using one way ANOVA method, where **P<0.01 *P<0.05.

Effect of *Appalakara chooranam* on haematological parameters in rats

The effects of ***Appalakara chooranam*** were observed for its effect on haematological parameters on the experimental rats. From the study it was evident that, a significant increase (p<0.01) were observed in the haemoglobin contents and RBC count in the group treated with 200 mg.kg^{-1} body weight of ***Appalakara chooranam*** and a significant decrease of the parameters occurred in the group treated with 400 mg.kg^{-1} b.w.t compared with the control. There was no significant change in the calcium level in all the treated animals compared to the control.

Table.6

Treatment	**Haemoglobin (mg.dl^{-1})**	**RBC (10^6 /mm^3)**	**WBC (10^6 /mm^3)**	**Calcium (mg.dl^{-1})**
Control	14.3± 0.25	9.15± 0.02	11.9± 0.05	10.40 ±0.06
Appalakara chooranam @50 mg.kg^{-1}	15.5± 0.26*	9.50± 0.04*	10.05± 0.01*	10.16 ±0.07
Appalakara chooranam @100 mg.kg^{-1}	15.3± 0.15*	9.55± 0.02*	8.8± 0.32*	10.22 ±0.24
Appalakara chooranam @200 mg.kg^{-1}	13.7± 0.20*	8.33± 0.12*	11.9± 0.03*	10.56 ±0.12

Appalakara chooranam @400 mg.kg^{-1}	14.5± 0.35*	8.51± 0.45*	11.05± 0.13*	10.70 ±0.06

Table.6.The effect of ***Appalakara chooranam*** on haematological parameters such as HB, Calcium, RBC and WBC in rats. A study on the effect of ***Appalakara chooranam*** on haematological parameters such as Hb, RBC, WBC, Calcium in rats was tested. where, group I animals (GPI) treated with normal saline (5 ml.kg^{1}), group II animals (GPII) with 50 mg.kg^{-1} of ***Appalakara chooranam***, group III animals (GPIII) with 100 mg.kg^{-1} of ***Appalakara chooranam***, group IV animals (GPIV) with 200 mg.kg^{-1} of ***Appalakara chooranam***, and group V animals (GPV) with 400 mg.kg^{-1} ***Appalakara chooranam***. The values are expressed as mean ± S.E.M. n=6. The results of group I were compared with other groups such as II, III, IV and V. The statistical analysis was carried out using one way ANOVA method, where *P<0.05.

Discussion

The evaluation of acute and sub-acute dosing in experimental animals may be more relevant in determining the overall toxicity of the plant preparation. The highest overall concordance of toxicity in animals in comparison with humans is with hematological, gastrointestinal, and cardiovascular adverse effects whiles certain adverse effects in humans, especially hypersensitivity and idiosyncratic reactions, are poorly correlated with toxicity observed in animals .

In the present study, where the acute toxicity study of ***Appalakara chooranam*** was carried out as per OECD-423 guidelines, no mortality was observed in both the animals of control group as well as animals treated with a maximum dose of 2000 mg.kg^{-1}. Hence, 1/10th of 2000 mg.kg^{-1} i.e. 200 mg.kg^{-1} of dose was selected as a minimum dose for sub-acute toxicity study.

The results of sub-acute toxicity study shows that there was no significant change in animal behaviour due to the absence of toxicity. The animals treated with ***Appalakara chooranam*** showed normal growth pattern and body weight compared with control rats treated with normal saline. So the changes in body weight can be

used as an indicator of adverse effects of drugs and chemicals .The changes in enzymes like ALP, AST and ALT levels show liver impairment, due to toxicity Serum cholesterol and proteins mainly regulated via synthesis in the liver and increase or decrease in serum concentrations of constituents suggest liver toxicity. The results of the present study were assessed after 28 days of administration of ***Appalakara chooranam***, and it was found that ***Appalakara chooranam*** at all concentrations do not produce liver damage.

There was a slight decrease in plasma glucose level, when higher doses of ***Appalakara chooranam***(400 $mg.kg^{-1}$) were administered in the treated rats..

Analysis of blood parameters is likely to risk evaluation as the change in hematological system has a higher predictive value for human toxicity, when data are translated from animal studies (Olson, *et al*., 2000).(7) After 28 days of treatment, there were no significant changes in the haematological parameters between control and treated groups. No significant changes in the levels of WBC, RBC were observed between control and test groups following repeated administration of ***Appalakara chooranam***. Interestingly, significant increase in the levels of hemoglobin was found in treatment with ***Appalakara chooranam*** with a higher dose of 400 $mg.kg^{-1}$. The possible reason could be that one of the constituents ***Appalakara chooranam*** may increase absorption of iron.

The overall results suggest that ***Appalakara chooranam*** are non toxic to the haaematopoietic and leucopoietic system. The haematopoietic and leucopoietic systems are the most sensitive targets for toxic compounds and an important index of physiological and pathological status in man and animal . Therefore, it is possible to assume that the ***Appalakara chooranam*** is non haematotoxic.

4.1.5: FTIR and EDAX ANALYSIS

4.1.5.a. Scanning electron microscopic study (SEM)

Scanning electron microscopy is a complementary technique and shows the nature of Appalakarachooranam and its particle size.Sample for SEM analysis were

mounted on the specimen stub using carbon adhesive sheet. Small sample were mounted with 1sq. cm glass slide And kept in carbon adhesive sheet (Yashvanth.S et al 2013) Samples were coated with gold to a thickness of 100 AO using Hitachi vacuum evaporator. Coated sample were analyzed in a Hitachi Scanning electron Microscope 3000 H model. Then the electronic image was captured and noted.

Elemental analysis by EDAX

EDAX is a non destructive technique and can be used for evaluvation in physiochemical properties of Applakara Choornam. This is very useful for the characterize crystalsof traceelements inAppalakaraChooranam (AKC). The Small pieces of salt of (3-4 mm) and 5-6mm2 pieces of salt were fixed in 4% glutraldehyde in phosphate buffer (Viz PH value 0.02 M, 6.9 M respectively). The sample was air dried and coated with gold in Hitachi HUS-5 GB Vacuum evaporator. SEM-EDAX analysis was carried out using INCA X-sight Oxford detector fitted to Hitachi S-520 Scanning Electron Microscope at an acceleration voltage of 20 KV.

4.1.5.b Fourier Transform – Infra Red Spectroscopy Study (FTIR)

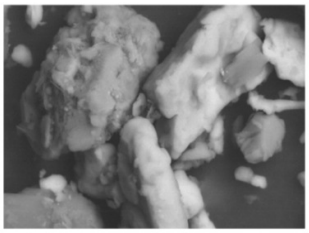
IR data acquired with Spectrum one FT-IR Spectrometer by means of KBr Pellet was used,. about 1/8th of the solid powder of Appalakarachooranam was taken on a microspatula and about 0.25-0.50 teaspoons of KBr was added and thoroughly ground in an agate mortar with the pestle until AKC.The sample was pressed at 5000-10,000 psi and the sample was removed carefully from the die and placed in the FTIR sample holder The sample was placed on Zn,Sel crystal with a spatula until the pressure marker noted.

Results and Discussion

The results of Scanning electron microscope in two different view and EDAX Trace elements profile & FT-IR data has compiled as follows.

4.1.5.c Scanning Electron Microscope Analysis (SEM)

The SEM (Fig.No.1 a) under 1.00 KX resolutions and the examining area of 800x800µm and 2 surface were taken. The surface of the AKC grains is uniformly arranged in agglomerates. Particle Size of the desired drug particle ranges from 3µm to 1613 µm in 2 µm (Figure 1 b).



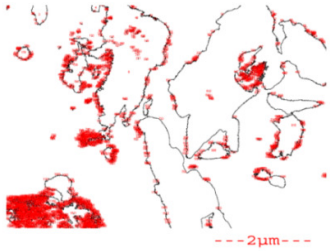
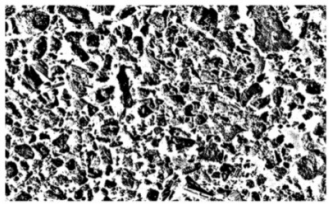


Fig.No.1a **Fig.No.1b**

In 100mu view, the surface of the sample grains is uniformly agglomerates. Particle Size ranges from Particle Size of the desired drug particle ranges from 296µm to 2792 µm.

(Figure. 2 a &b) SEM image and plotting diagram of Appalakarachooranam in 20µm



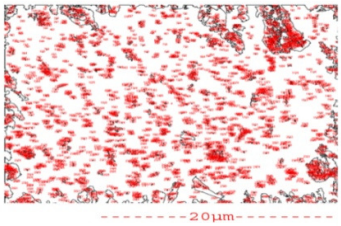


Fig.No.2a **Fig.No.2b**

4.1.5.d. Elemental Quantification of Appalakarachooranam by EDAX

The elemental quantification of Appalakarachooranam was carried by the SEM-EDAX methods.The overall trace elements like Sodium,potassium, Chlorine and oxygen viz35.59%, 30.29%, 18.07, 30.29% respectively. The sample was placed on Zn, Sel crystal with a spatula until the pressure marker noted. Results and Discussion The results of Scanning electron microscope in two different view and EDAX Trace elements profile & FT-IR data has compiled as follows. Scanning Electron Microscope Analysis The SEM (Fig.No.1 a) under 1.00 KX resolutions and the examining area of 800x800µm and 2 surface were taken. The surface of the AKC grains is uniformly arranged in agglomerates. Particle Size of the desired drug particle ranges from 3µm to 1613 µm in 2 µm (Figure 1 b). In FT-IR Spectra analysis, the values are recorded in table no 1.The peak value is 3462.22 to 3695.61 onO-H stretching, 2520.96 has C-H stretching, 2380.16 has N-H stretching, 2254.79 has -C≡Nstretching, 2108.20 has N=C=S stretching, 1635.64 has C=C stretching, 1460.11 has C-H bending, 1336.67 has O-H bending. Thus the corresponding peak valuehas

separate functional groups viz Alcohol, Alkene, Amine salt, nitrates, Isothyiocyante, Alkenes, and Phenolic compound etc.

Identification of trance elements through EDAX

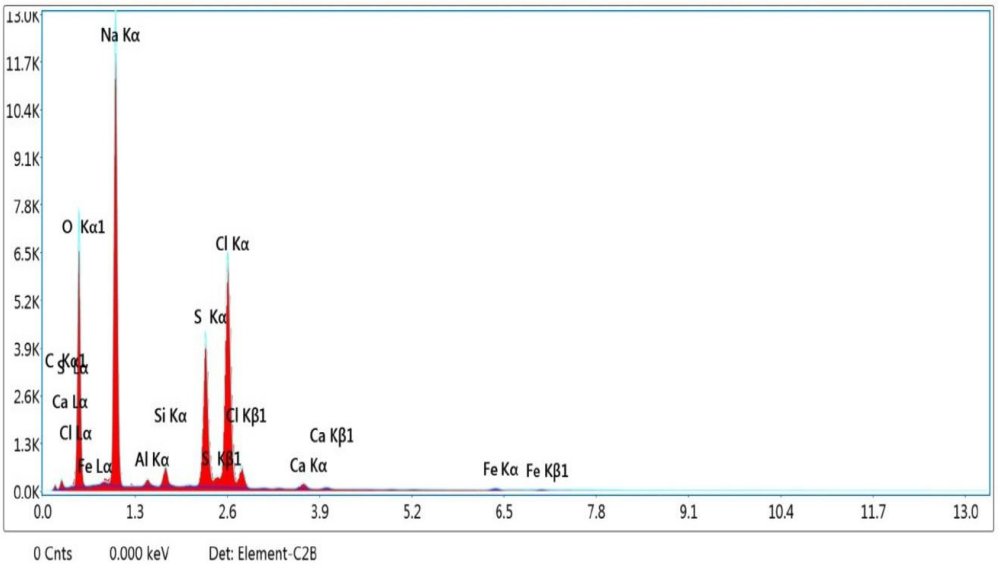


Fig. No. 3

Graphical representation of EDAX Profile

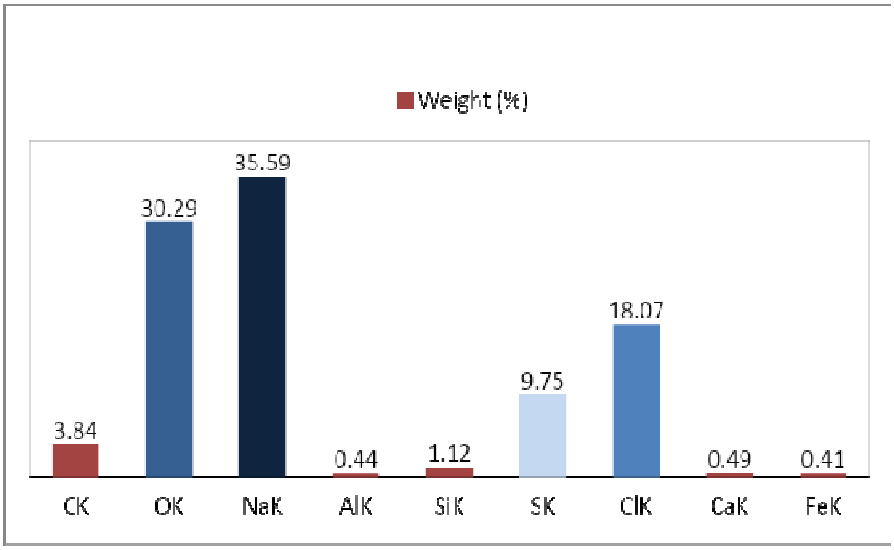


Fig. No 4

FTIR Spectra of AppalakaraChooranam

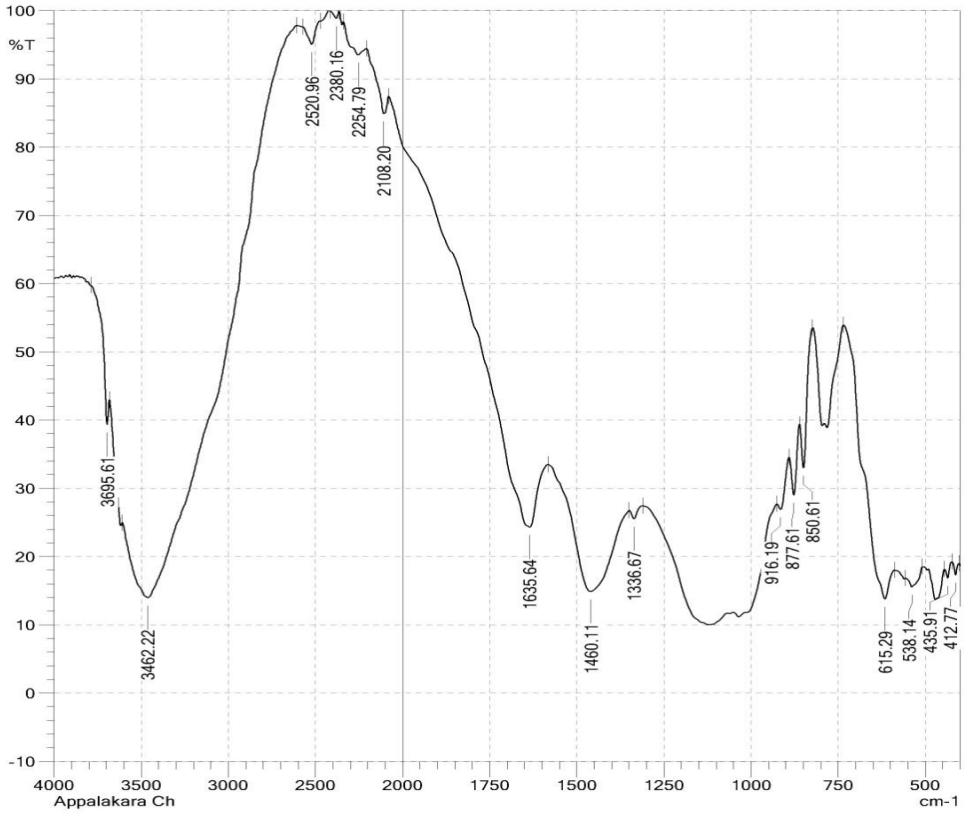


Fig. No 5

Table 1.FTIR observed Peak value ofAppalakarachooranam

Wave number (cm-1)	Intensity of the bond	Functional groups	
3695.61	O-H stretching	variable	alcohol
3462.22	O-H stretching	Variable	intermolecular bonded
2520.96	C-H streching	Medium	Alkene
2380.16	N-H stretching	Strong	amine salt
2254.79	-C≡Nstretching	Weak	nitrile
2108.20	N=C=S stretching	Strong	Isothiocyanate
1635.64	C=C stretching	Medium	Alkene
1460.11	C-H bending	Medium	Alkane
1336.67	O-H bending	medium	Phenolic compound

916.19	C=C bending	Strong	Alkene
877.61	aromatic C-H bending	medium	Alkane
850.61	C-Cl stretching	Strong	halo compound
615.29	C-Br stretching	Strong	halo compound (alkyl)
538.14	C-Br bending	Week	Alkyl

In FT-IR Spectra analysis, the values are recorded in **table no 1**.The peak value is 3462.22 to 3695.61 onO-H stretching, 2520.96 has C-H stretching, 2380.16 has N-H stretching, 2254.79 has -C≡Nstretching, 2108.20 has N=C=S stretching, 1635.64 has C=C stretching, 1460.11 has C-H bending, 1336.67 has O-H bending. Thus the corresponding peak valuehas separate functional groups viz Alcohol, Alkene, Amine salt, nitrates, Isothyiocyante, Alkenes, and Phenolic compound etc.

Conclusion

In Siddha System of medicine is bioeffective and safe therapeutic potentials of AKC. On the line, the drug Appalakarachooranam lies on the track and the above data showed that the spectroscopic standardization of the AKC. Final conclusion is FTIR, EDAX and SEM analytical studies showed no harmful chemicals and minerals etc.so,applakarrachoornam is safe to use in long period. Thefurther research works has to be carried out for the development of scientific data to hold the drug in a scientific manner.

4.1.6 BIO-CHEMICAL ANALYSIS OF APPALAKARA CHOORANAM PREPARATION OF THE EXTRACT

The extract is directly prepared from the trial drug Appalakara Chooranam.

QUALITATIVE ANALYSIS

Sl. No.	EXPERIMENT	OBSERVATION	INFERENCE
1.	**TEST FOR CALCIUM** 2ml of the above prepared extract is taken in a clean test tube. To this add 2ml of 4% Ammonium oxalate solution.	No white precipitate is formed.	Absence of calcium.
2.	**TEST FOR SULPHATE:** 2ml of the extract is added to 5% Barium chloride solution.	A white precipitate is formed	Indicates the presence of Sulphate.
3.	**TEST FOR CHLORIDE** The extract is treated with Silver nitrate solution.	A white precipitate is formed.	Indicates the presence of chloride.
4.	**TEST FOR CARBONATE** The substance is treated with concentrated Hcl.	brisk effervescence is formed.	Indicates the presence of Carbonate.
5.	**TEST FOR STARCH** The extract is added with weak Iodine solution.	No blue colour is formed.	Absence of Starch.
6	**TEST FOR IRON FERRIC** The extract is acidified with Glacial acetic acid and Potassium ferro cyanide.	No blue colour is formed.	Absence of ferric Iron
7.	**TEST OF IRON FERROUS** The extract is treated with concentrated Nitric acid and Ammonium thio cynaate solution.	Blood red colour is formed.	Indicates the presence of ferrous Iron.
8.	**TEST FOR PHOSPHATE** The extract is treated with Ammonium molybdate and concentrated Nitric acid.	No yellow precipitate is formed.	Absence of phosphate.
9.	**TEST FOR ALBUMIN** The extract is treated with Esbach's reagent.	No yellow precipitate is formed.	Absence of albumin.
10.	**TEST FOR TANNIC ACID** The extract is treated with Ferric choloride.	No blue black precipitate is formed.	Absence of tannic acid.

Sl. No.	EXPERIMENT	OBSERVATION	INFERENCE
11.	**TEST FOR UNSATURATION** Potassium permanganate solution is added to the extract.	It gets decolourised.	Indicates the presence of unsaturated compound**.**
12.	**TEST FOR THE REDUCING SUGAR** 5ml of Benedict's qualitative solution is taken in a test tube and allowed to boil for 2 mts and added 8-10 drops of the extract and again boil it for 2 mts.	No colour change occurs.	Absence of reducing sugar**.**
13.	**TEST FOR AMINO ACID** One or two drops of the extract is placed on a filter paper and dried it well. After drying, 1% Ninnydrin is sprayed over the same and dried it well.	No violet colour is formed.	Absence of amino acid**.**
14.	**TEST FOR ZINC:** The extract is treated with Potassium Ferrocyanide.	No white precipitate is formed.	Absence of Zinc.

INFERENCE: Calcium, Sulphate, chloride, Carbonate, ferrous Iron and unsaturated compound are present in the trial drug Appalakara Chooranam.

4.1.7 ANTIMICROBIAL RESULTS

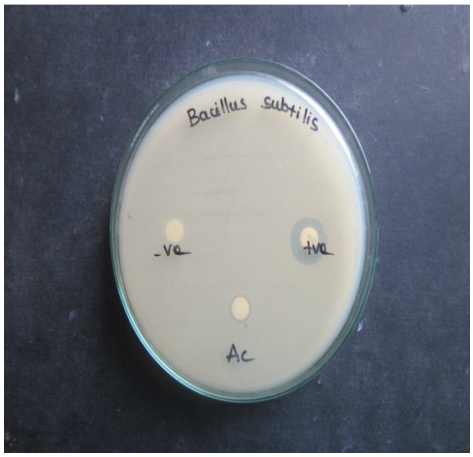
Sample Code	Bacteria Strains Name				
	Staphylococcus aureus (G+)	*Streptococcus mutans* (G+)	*Bacillus subtilis* **(G+)**	*Klebsilla pneumonia* (G-)	E – coli (G-)
AC	7	11	8	10	10
PC	27	17	14	28	18
NC	-	-	-	-	-

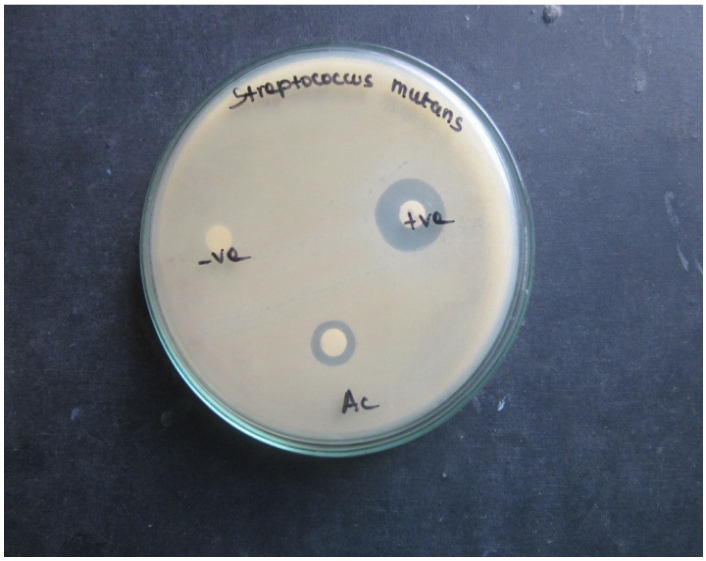
Keys

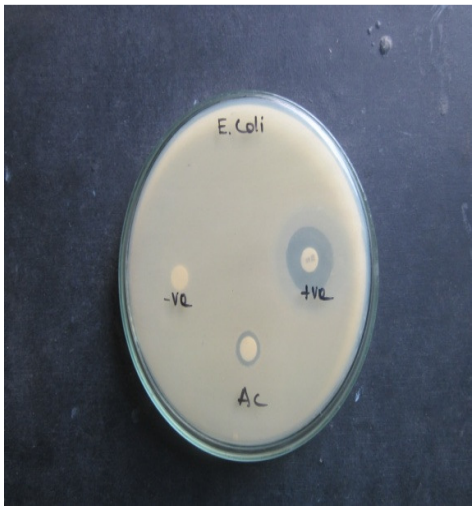
PC - ***Positive Control (Streptomycin)***
NC - ***Negative Control***
- - ***No Zone***
Mm - ***Millimetre***
G+ - ***Gram Positive Organism***
G- - ***Gram Negative Organism***

The medium was prepared by dissolving 38 gram of Muller Hinton Agar Medium (HI media) in 1000 milli litre of distilled water .. The dissolved medium was autoclaved at 15Lbs pressure at 121^{o} C for 15 min (pH 7.3) the autoclaved medium was cooled ,mixed well and poured petriplates (25ml/plate)the plates were swabbed with pathogenic bacteria culture viz.

ANTIMICROBIAL RESULTS FIGURES







4.2 CLINICAL STUDY

OBSERVATIONS AND RESULT

The clinical study 40 patients were selected, 20 patients in OPD and remaining 20 patients were treated in IPD at PG Department of Pothu Maruthuvam, G.S.M.C Palayamkottai. Results were documented in following the headings,

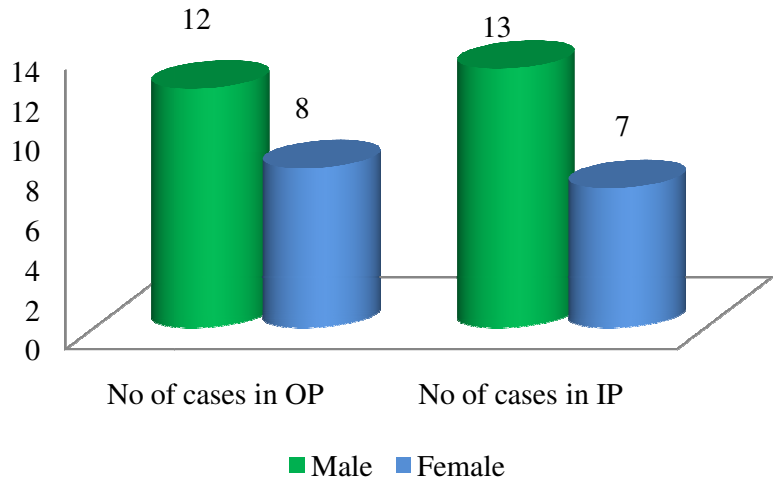
1. Sex
2. Age
3. Kaalam
4. Constitution of the Body
5. Gunam
6. Religion
7. Thinai
8. Paruvakaalam
9. Occupational status
10. Diet
11. Socio-Economic status
12. Aetiological factors
13. Mode of onset
14. Duration of illness
15. Clinical manifestation
16. Gnanendrium
17. Kanmendrium
18. Conditions of Mukkutram :
    i) Vatham
    ii) Pitham
    iii) Kapham
    iv) Thontham
19. Udal thathukkal
20. Envagai Thervugal
21. Neikuri
22. Assessment of outcome
    a) Before treatment
    b) After treatment
23. Radiological findings
24. Gradation of Results

1) SEX

Table 1: sex distribution

S.No	Sex	Out Patients (OP)		Inpatients (IP)	
		No of cases	%	No of cases	%
1.	Male	12	60	13	65
2.	Female	08	40	07	35

Figure 1: sex distribution



Inference :

20 out patients, 60% were male and 40% were females.

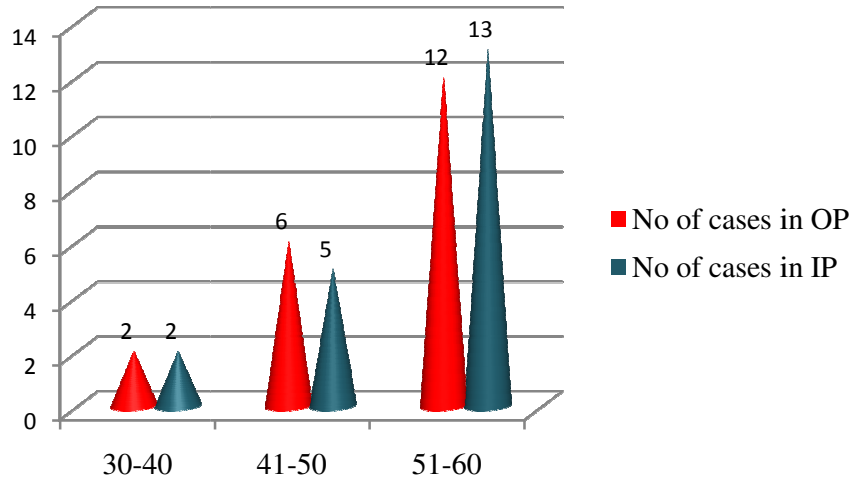
65% were male and 35% females were affected

2) AGE

Table 2 :Age distribution

S.No	Age group in year	Out Patients (OP)		Inpatients (IP)	
		No of cases	%	No of cases	%
1.	30-40	2	10	2	10
2.	41-50	6	30	5	25
3	51-60	12	60	13	65

Figur 2: Age distribution



Inference:

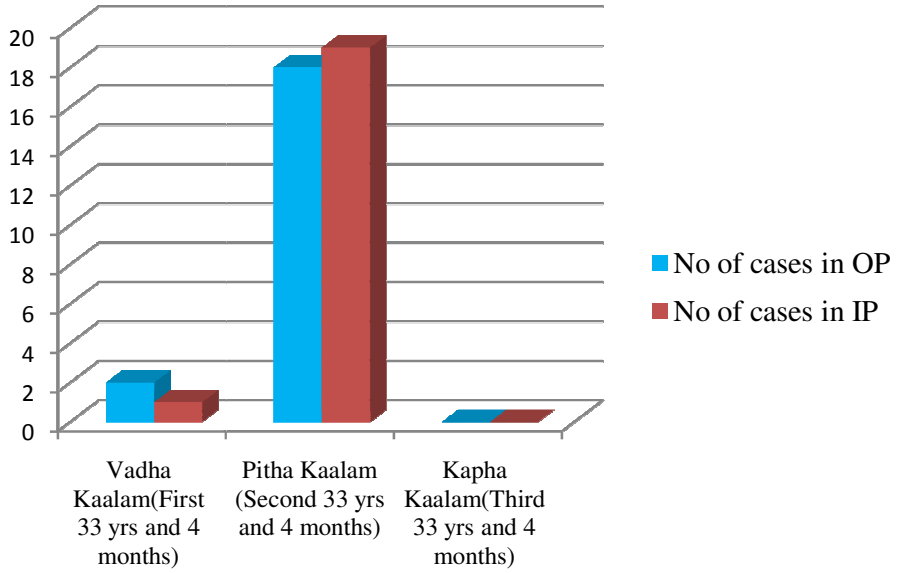
20 out patients were selected, 10% people were affected in age group 30-40 years, 30% were affected in 41-50 years ,60% were affected in 51-60years patients .20 In patients were selected ,10% people were affected in age group 30-40 years, 25% were affected in 41-50 years ,65% were affected in 51-60years.

3) KAALAM

Table 3 : Kaalam distribution

S.No	Kaalam	Out Patients (OP)		Inpatients (IP)	
		No of cases	%	No of case	%
1.	Vatha Kaalam (First 33 yrs and 4 months)	2	10	1	5
2.	Pitha Kaalam (Second 33 yrs and 4 months)	18	90	19	95
3.	Kapha Kaalam (Third 33 yrs and 4 months)	0	0	0	0

Figure : 3 Kaalam distribution



Inference :

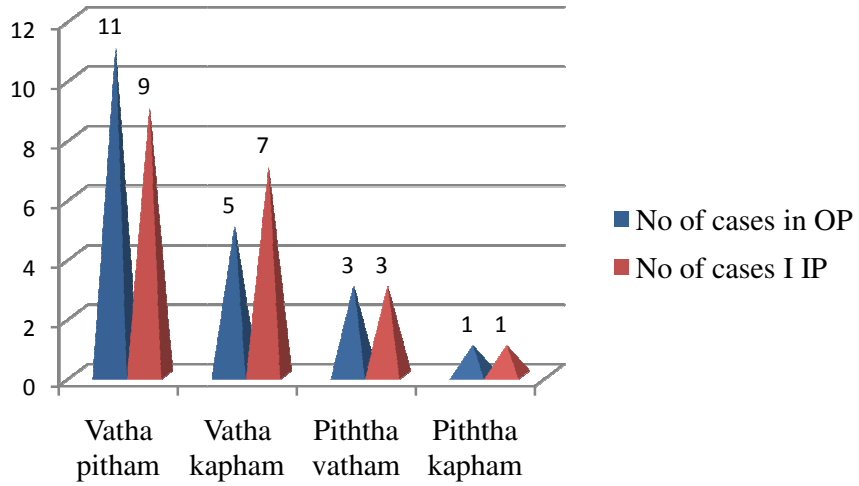
20 out patients were selected 10% comes under Vatha kaalam, 90% comes under pitha kaalam. 20 In patients were selected 5% comes under Vatha kaalam, 95% comes under pitha kalam

4) CONSTITUTION OF THE BODY :

Table 4: Constitution of the body distribution

S.No	Constitution of the body	Out Patients (OP)		Inpatients (IP)	
		No of cases	%	No of cases	%
1.	Vatha pitham	11	55	9	45
2.	Vatha kapham	5	25	7	35
3.	Piththa vatham	3	15	3	15
4.	Piththa kapham	1	5	1	5

Figure :4: Constitution of the body distribution



Inference :

20 out patients were selected, 55% were affected in vatha piththa thegi, 25% were affected in vatha kapha thegi, 15% were affected in piththa vatha thegi,5% were afeced in piththa kapha thegi.

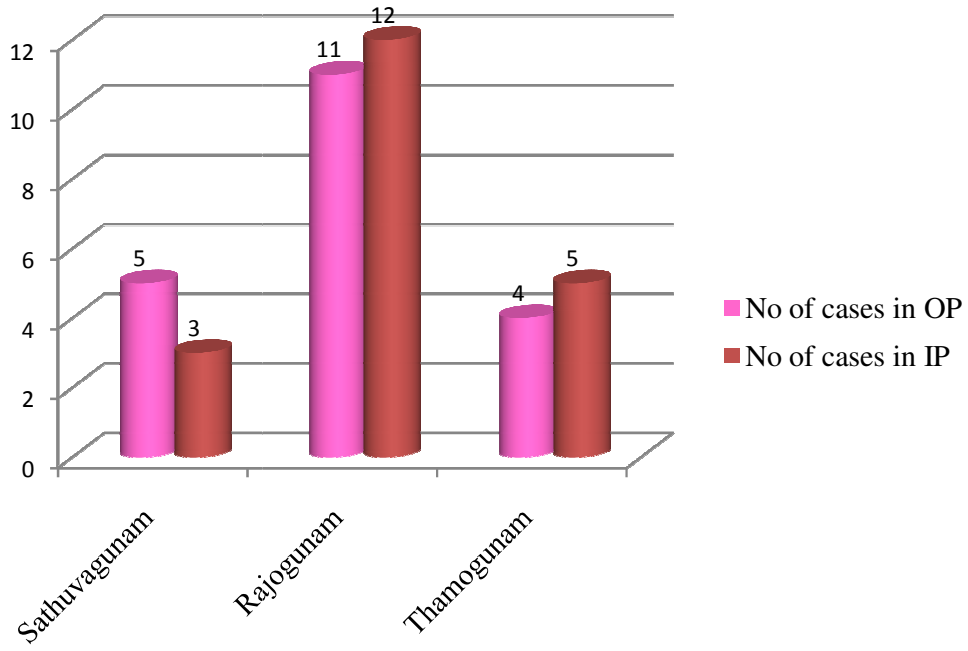
20 In patients were selected,45 % were affected in vatha piththa thegi, 35% were affected in vatha kapha thegi, 15% were affected in piththa vatha thegi,5% were afeced in piththa kapha thegi.

5) GUNAM

Table 5: Gunam distribution

S.No	Gunam	Out Patients (OP)		Inpatients (IP)	
		No of cases	%	No of cases	%
1.	Sathuvagunam	5	25	3	15
2.	Rajogunam	11	55	12	60
3.	Thamogunam	4	20	5	25

Figure :5 Gunam distribution



Inference :

20 out patients were selected, 55% were affected in Rajogunam, 25% were affected in Sathuvagunam , 20% were affected in Thamogunam.

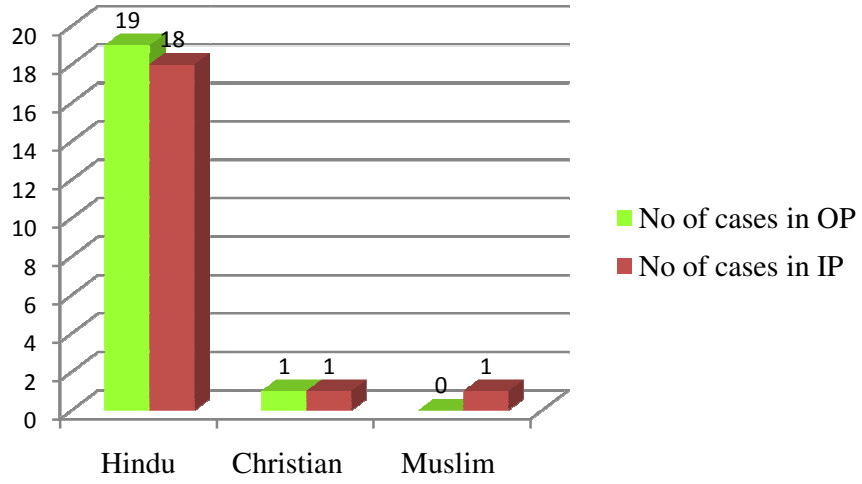
20 In patients were selected, 60% were affected in Rajogunam, 15% were affected in Sathuvagunam ,25 % were affected in Thamogunam.

6) RELIGION

Table: 6 Religion distribution

S.No	Religion	Out Patients (OP)		Inpatients (IP)	
		No of cases	%	No of cases	%
1.	Hindu	19	95	18	90
2.	Christian	1	5	1	5
3.	Muslim	0	0	1	5

Figure:6 Religion distribution



Inference :

20 out patients were selected, 95% were affected in Hindu people, 5% Christian people were affected .

20 In patients were selected, 90% were affected in Hindu people ,5% were affected in Christian people ,5 % Muslim people were affected.

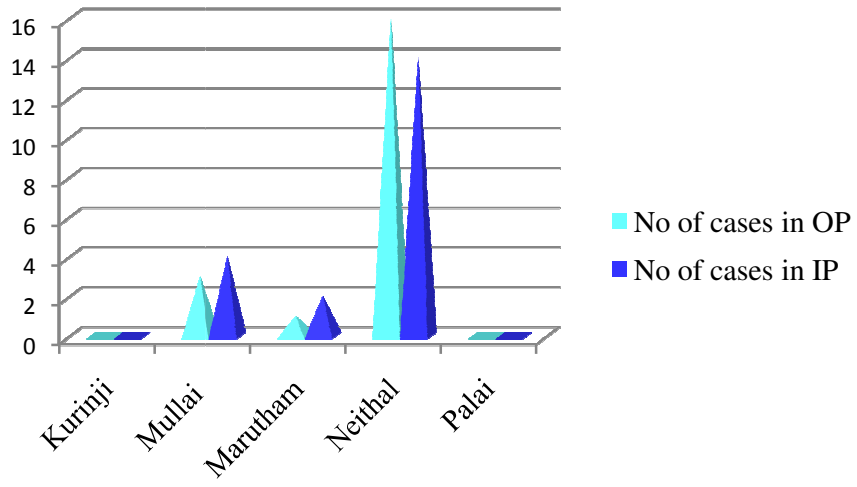
.

7) THINAI

Table :7 Thinai distribution

S.No	Thinai	Out Patients (OP)		Inpatients (IP)	
		No of cases	%	No of cases	%
1.	Kurinji	0	0	0	0
2.	Mullai	3	15	4	20
3.	Marutham	1	5	2	10
4.	Neithal	16	80	14	70
5.	Palai	0	0	0	0

Figure : 7 Thinai distribution



Inference :

20 out patients were selected, 15% were affected in Mullai, 5% were affected in Marutham, 80% were affected in Neithal land.

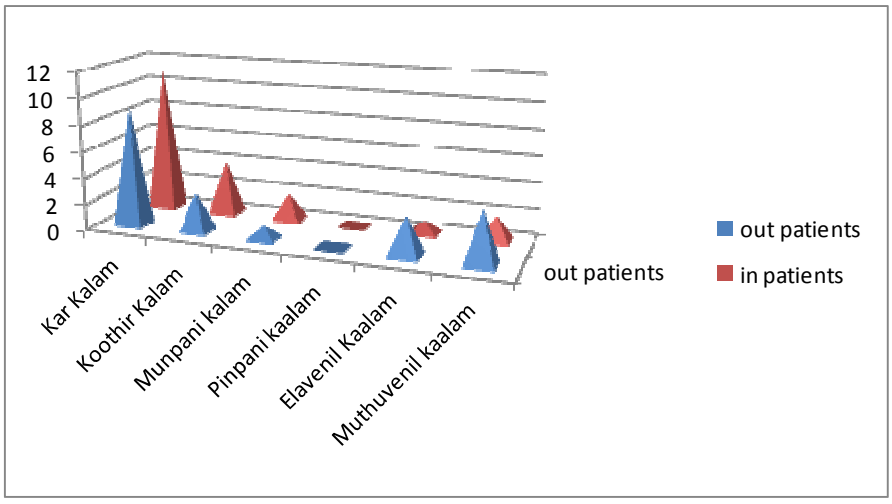
20 In patients were selected , 20% were affected in Mullai, 10% were affected in Marutham, 70% were affected in Neithal land.

8) PARUVA KALAM

Table 8: Paruva kalam distribution

S.No	Paruvakalam	Months	Out Patients (OP)		Inpatients (IP)	
			No of cases	%	No of cases	%
1.	Kar Kalam	Aavani- Puratasi	9	45	11	55
2.	Koothir Kalam	Iyppasi - Karthigai	3	15	4	20
3.	Munpani kalam	Markazhi – Thai	1	5	2	10
4.	Pinpani kaalam	Masi- Panguni	0	0	0	0
5.	Elavenil Kaalam	Chithirai - Vaikasi	3	15	1	5
6.	Muthuvenil kaalam	Aani- Aadi	4	20	2	10

Figure : 8 Paruva kalam distribution



Inference :

20 out patients were selected, 45% were affected in Kaar kaalam, 15% were affected in Koothir kaalam, 5% were affected in Munpani kaalam,15% were affected in Elavenil kaalam,20% were affected in Muthuvenil kaalam.

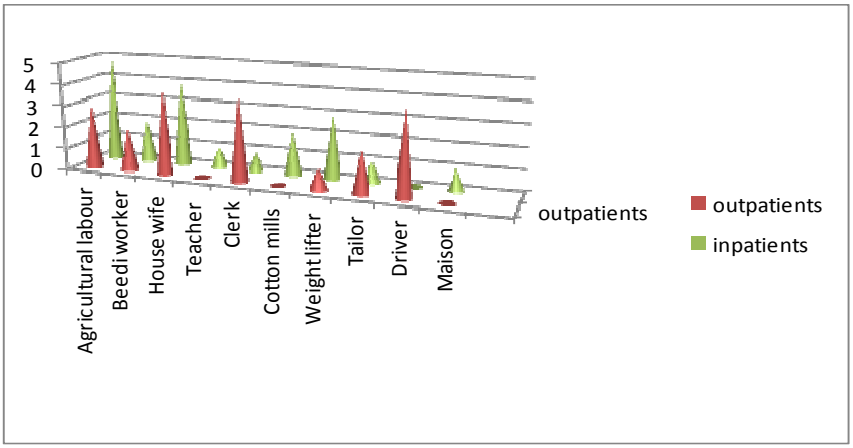
20 In patients were selected, 55% were affected in Kaar kaalam, 20% were affected in Koothir kaalam, 10% were affected in Munpani kaalam,5% were affeced in Elavenil kaalam,10% were affected in Muthuvenil kaalam.

9) Occupation :

Table 9: Occupation distribution

S.No	Occupation	Out Patients (OP)		Inpatients (IP)	
		No of cases	%	No of cases	%
1.	Agricultural labour	3	15	5	25
2.	Beedi worker	2	10	2	10
3.	House wife	4	20	4	20
4.	Teacher	0	0	1	5
5.	Clerk	4	20	1	5
6.	Cotton mills	0	0	2	10
7.	Weight lifter	1	5	3	15
8.	Tailor	2	10	1	5
9.	Driver	4	20	0	0
10.	Mesan	0	0	1	5

Figure 9: **Occupation distribution**



Inference :

20 out patients were selected, 15% were affected in agricultural labour, 10% were affected in beedi worker, 20% were affected in house wife,20% were affected in clerk,5% were affected in weight lifter,10% were affected in tailor,20% driver were affected.

20 in patients were selected, 25% were affected in agricultural labour, 10% were affected in beedi worker, 20% were affected in house wife, 5% were affected in

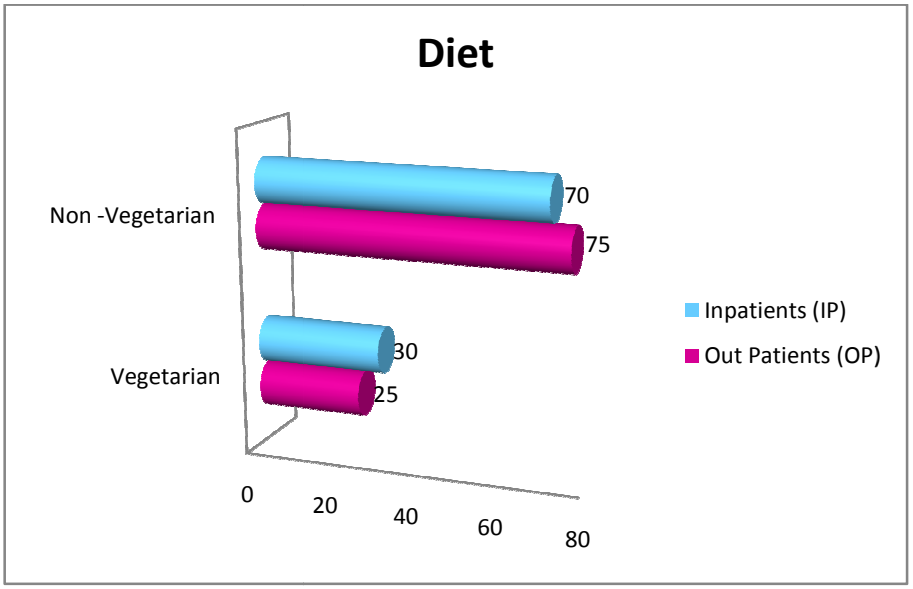
teacher, 5% were affected in clerk,10% were affected in cotton mill, 15% were affected in weight lifter,5% were affected in tailor,5% mesan were affected.

10) DIET :

Table 10:Diet Distribution

S.No	Diet	Out Patients (OP)		Inpatients (IP)	
		No of cases	%	No of cases	%
1.	Vegetarian	5	25	6	30
2.	Non –Vegetarian	15	75	14	70

Figure 10: Diet Distribution



Inference :

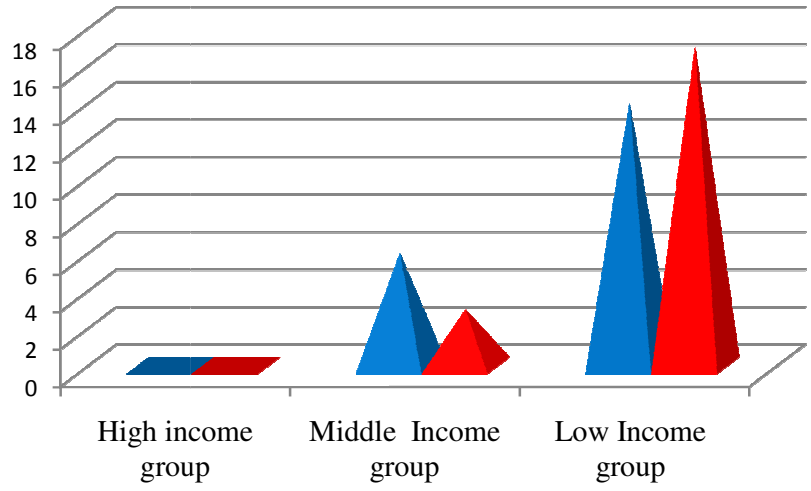
20 out patients were selected, 25% were affected in vegetarian people , 75% were affected in mixed vegetarian people. 20 in patients were selected, 30% were affected in vegetarian people, 70% were affected in mixed vegetarian.

11) SOCIO- ECONOMIC STATUS

Table : 11 Socio- Economic status distribution

S.No	Socio- Economic Status	Out Patients (OP)		Inpatients (IP)	
		No of cases	%	No of cases	%
1.	High income group	0	0	0	0
2.	Middle Income group	6	30	3	15
3.	Low Income group	14	70	17	85

Figure 11: : Socio- Economic status



Inference :

70% of cases mostly affected in Low income people and remaining 30% cases were in affected in Middle income group. High income peoples are not affected.

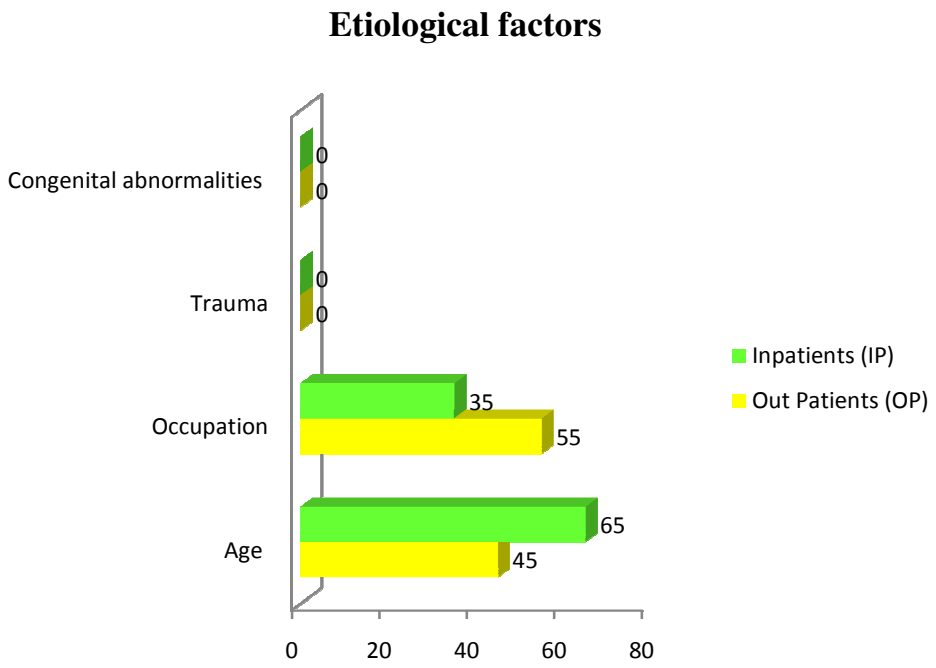
85% of cases were affected in Low income people and remaining 15% cases were affected in Middle income group. High income peoples are not affected.

12) ETIOLOGICAL FACTORS :

Table 12: .Etiological factors distribution

S.No	Aetiological factors	Out Patients (OP)		Inpatients (IP)	
		No of cases	%	No of cases	%
1.	Age	9	45	13	65
2.	Occupation	11	55	7	35
3.	Trauma	0	0	0	0
4.	Congenital abnormalities	0	0	0	0

Figure12. Etiological factors distribution



Inference :

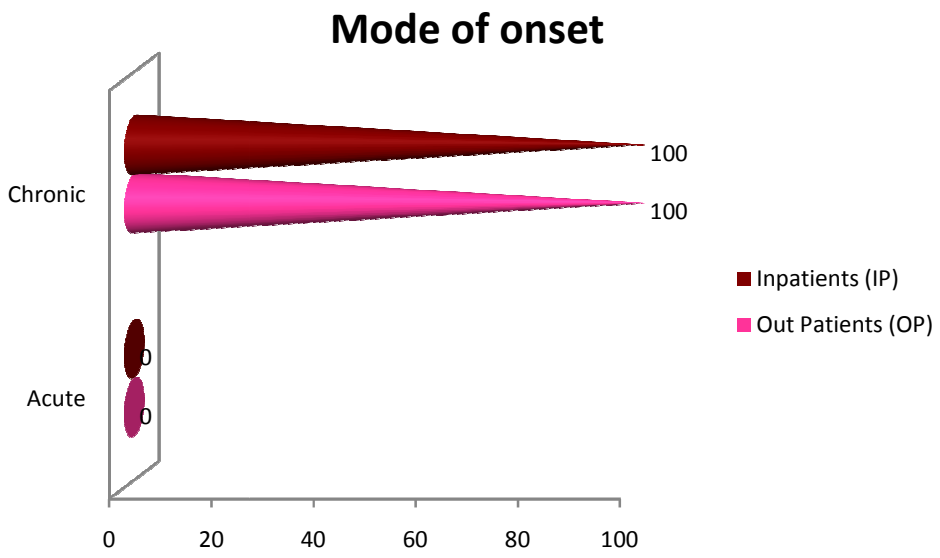
The mode of etiological factors of cegana vatham was 45% people were affected in age related degenerative disease in OPD. 35% of cases were affected in occupational disorders and 65% of the cases were affected in age related degenerative disease in IPD.

13).MODE OF ONSET

Table 13: Mode of onset distribution

S.No	Mode of onset	Out Patients (OP)		Inpatients (IP)	
		No of cases	%	No of cases	%
1.	Acute	0	0	0	0
2.	Chronic	20	100	20	100

Figure13: **Mode of onset distribution**



Inference

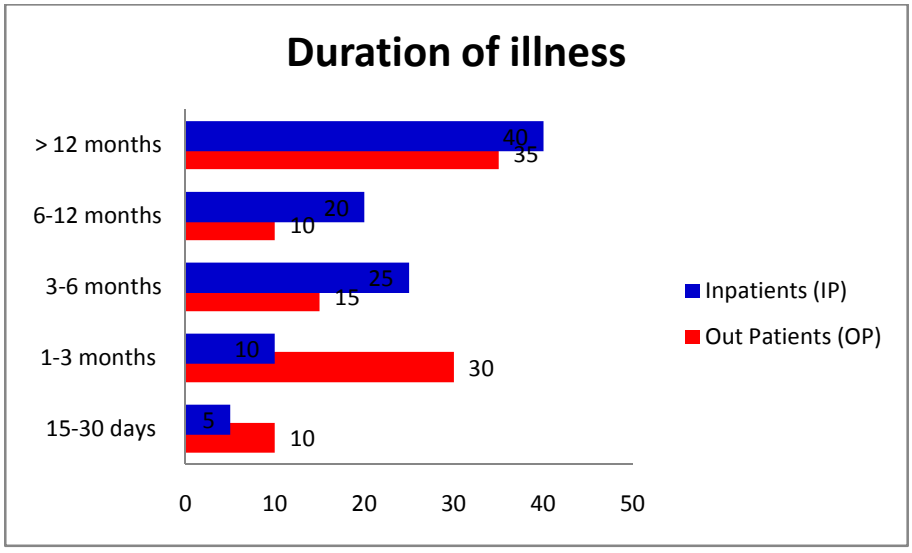
The chronic onset of the *cegana vatham* was 100% people were affected in both OPD and IPD.

14) DURATION OF ILLNESS

Table14: Duration of illness distrbution

S.No	Duration of illness	Out Patients (OP)		Inpatients (IP)	
		No of cases	%	No of cases	%
1.	15-30 days	2	10	1	5
2.	1-3 months	6	30	2	10
3.	3-6 months	3	15	5	25
4.	6-12 months	2	10	4	20
5.	> 12 months	7	35	8	40

Figure 14:. Duration of illness distrbution



Inference :

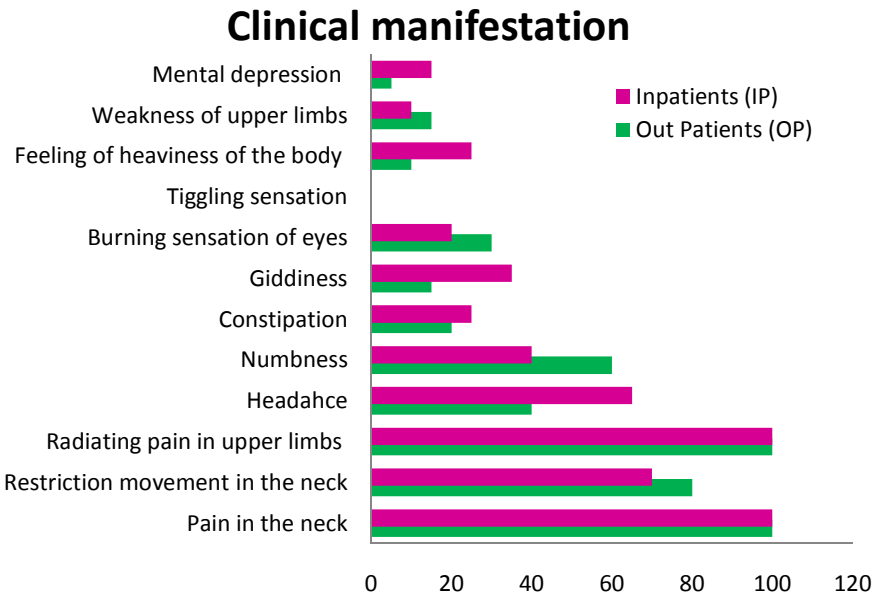
Duration of illness was 35% in > 12 months, 30% in 1-3 months, 15% in 3-6 months, 10% in 6-12 months and 10% in 15-30 days were affected in OPD. The duration of illness was 10% in 1-3 months, 25% in 3-6 months, 20% in 6-12 months, 40% in >12 months, 5% in 15-30 days were affected in IPD.

15) CLINICAL MANIFESTATION

Table 15: Clinical manifestation distribution

S.No	Signs and symptoms	Out Patients (OP)		Inpatients (IP)S	
		No of cases	%	No of cases	%
1.	Pain in the neck	20	100	20	100
2.	Restricted movement in the neck	18	80	14	70
3.	Radiating pain in upper limbs	20	100	210	100
4.	Headache	8	40	13	65
5.	Numbness	12	60	8	40
6.	Constipation	4	20	5	25
7.	Giddiness	3	15	7	35
8.	Burning sensation of eyes	6	30	4	20
9.	Tingling sensation	0	0	0	0
10.	Feeling of heaviness of the body	2	10	5	25
11.	Weakness of upper limbs	3	15	2	10
12.	Mental depression	1	5	3	15

Figure 15: Clinical manifestation distribution



Inference :

In OPD, 100% of the cases had neck pain, radiating pain and 80% of the cases had restricted neck movements, 60% of the cases had numbness, 40% of the cases had headache, 30% of the cases had burning sensation of eyes. 20% of the cases had constipation, 10% of the cases had feeling heaviness of the body, 15% the cases had weakness of the upper limbs and 5% of the cases had mental depression were observed in Clinical trial.

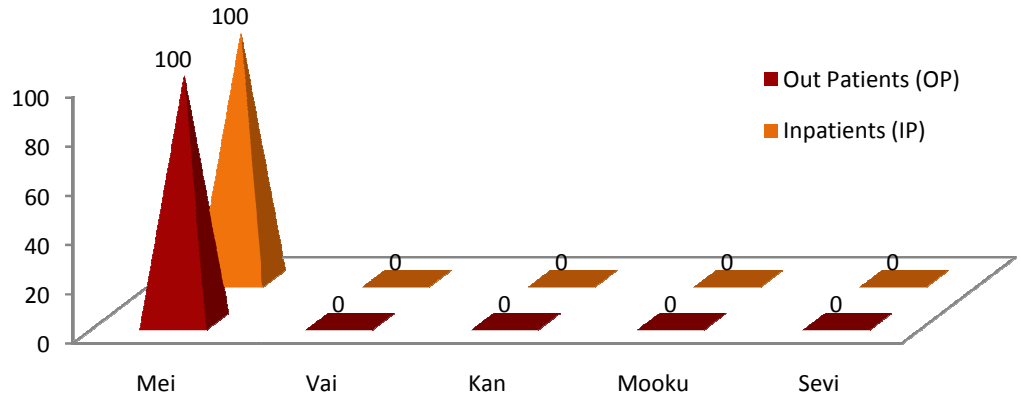
In IPD, 100% of the cases had neck pain, radiating pain and 70% of the cases had restricted neck movements, 40% of the cases had numbness, 65% of the cases had headache, 30% of the cases had burning sensation of eyes, 25% of the cases had constipation, 25% of the cases had feeling heaviness of the body, 10% of the cases had weakness of the upper limbs and 15% of the cases had mental depression were observed.

16) GNANENDRIUM

Table 16: Gnanendrium reference distssribution

S.No	Gnanendrium	Out Patients (OP)		Inpatients (IP)	
		No of cases	%	No of cases	%
1.	Mei	20	100	20	100
2.	Vai	0	0	0	0
3.	Kan	0	0	0	0
4.	Mooku	0	0	0	0
5.	Sevi	0	0	0	0

Figure 16: Gnanendrium reference distssribution



Inference :

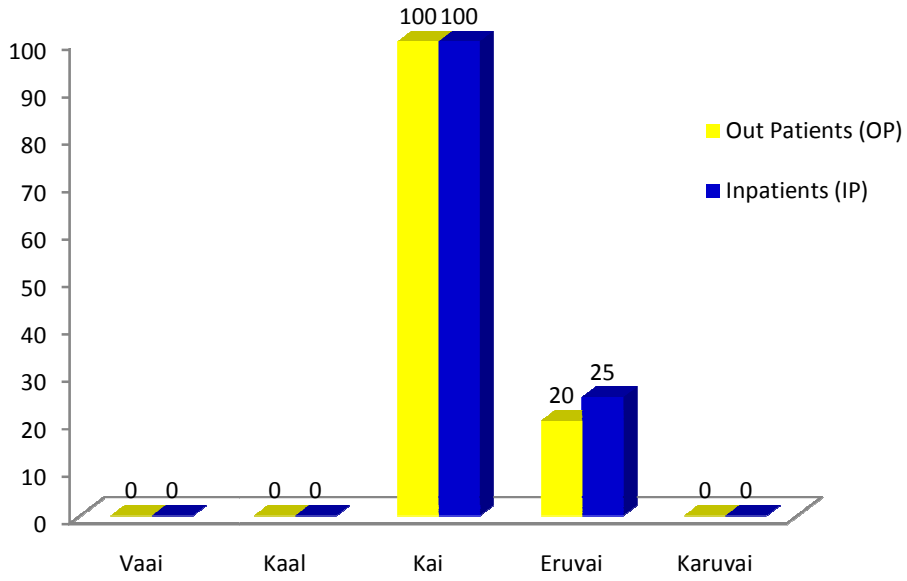
100% peoples were affected Mei. The Kan, Vai, Mooku and Sevi were not affected.

17) KANMENRIUM

Table 17: Kanmendrium distribution

S.No	Kanmendrium	Out Patients (OP)		Inpatients (IP)	
		No of cases	%	No of cases	%
1.	Vaai	0	0	0	0
2.	Kaal	0	0	0	0
3.	Kai	20	100	20	100
4.	Eruvai	4	20	5	25
5.	Karuvai	0	0	0	0

Figure 17. Kanmendrium distribution



Inference :

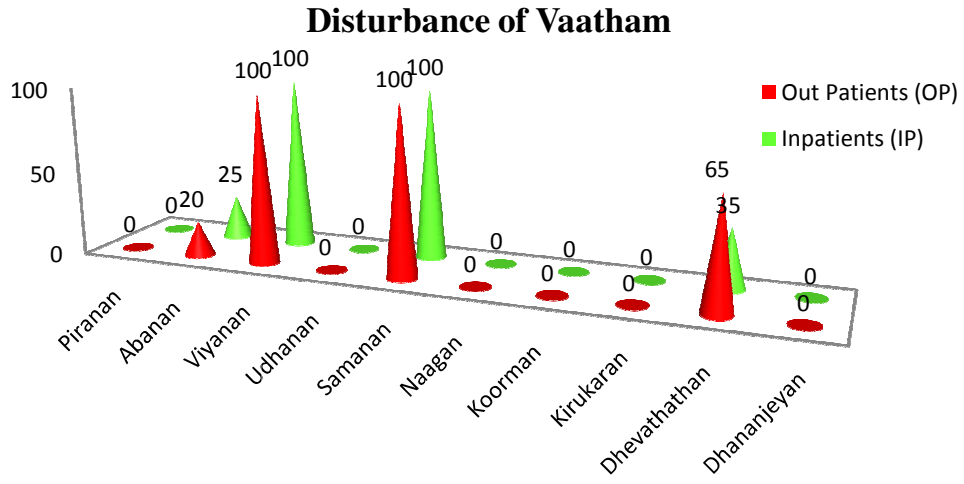
100% were affected in Kai and 20% were affected in Eruvai. 100% peoples were affected in Kai and 25% were affected Eruvai in IPD.

18) CONDITIONS OF MUKKUTRAM :

Table 18 a :Disturbance of Vaatham distribution:

S.No	Disturbance of Vaatham	Out Patients (OP)		Inpatients (IP)	
		No of cases	%	No of cases	%
1.	Piranan	0	0	0	0
2.	Abanan	4	20	5	25
3.	Viyanan	20	100	20	100
4.	Udhanan	0	0	0	0
5.	Samanan	20	100	20	100
6.	Naagan	0	0	0	0
7.	Koorman	0	0	0	0
8.	Kirukaran	0	0	0	0
9.	Dhevathathan	13	65	7	35
10.	Dhananjeyan	0	0	0	0

Figure 18 a :Disturbance of Vaatham distribution :



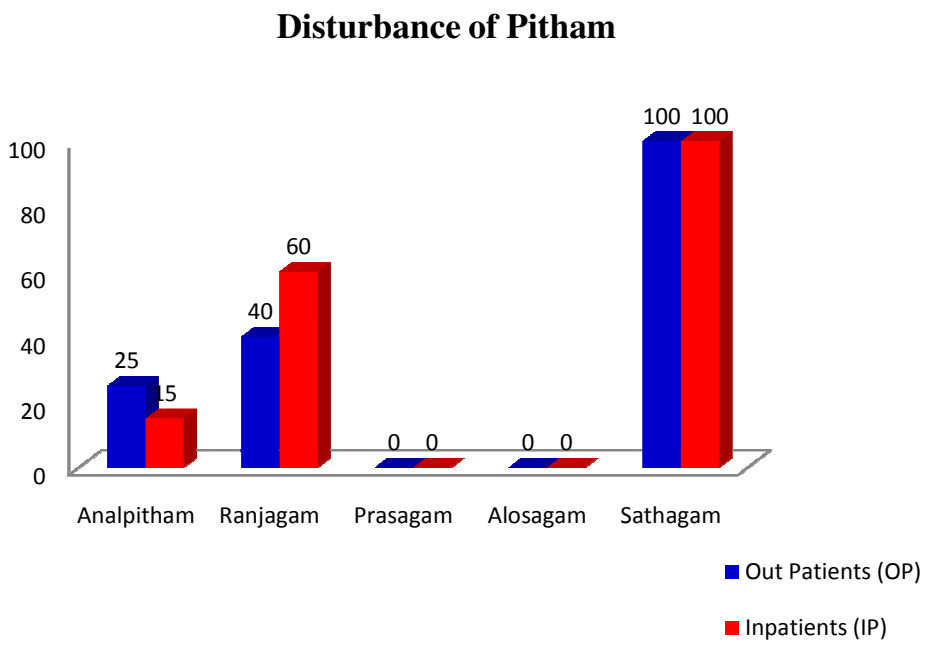
Inference :

Abanan was 20% affected, 65% dhevathathan was affected and 100% Viyanan and Samanan were affected in OP patients. 20% Abanan was affected, 35% dhevathathan was affected and 100% peoples Viyanan and Samanan were affected in IP.

Table 18 b:Disturbance of Pitham distribution:

S.No	Disturbance of Pitham	Out Patients (OP)		Inpatients (IP)	
		No of cases	%	No of cases	%
1.	Analpitham	5	25	3	15
2.	Ranjagam	8	40	12	60
3.	Prasagam	0	0	0	0
4.	Alosagam	0	0	0	0
5.	Sathagam	20	100	20	100

Figure 18 b:Disturbance of Pitham distribution :



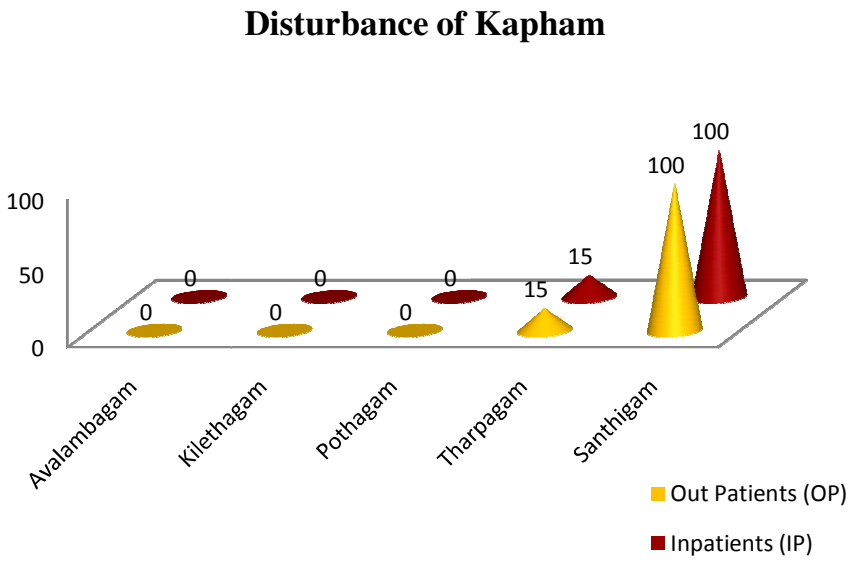
Inference :

25% Analpitham was affected, 40% Ranjagm was affected. 100% Sathaga pitam was affected OPD. 5% Analpitham was affected. 60% Ranjaga pitham was affected and 100% Sathaga pitham was affected.

Table 18 c: Disturbance of Kapham distribution

S.No	Disturbance of Kapham	Out Patients (OP)		Inpatients (IP)	
		No of cases	%	No of cases	%
1.	Avalambagam	0	0	0	0
2.	Kilethagam	0	0	0	0
3.	Pothagam	0	0	0	0
4.	Tharpagam	3	15	3	15
5.	Santhigam	20	100	20	100

Figure 18 c: Distance of Kapham distribution



Inference :

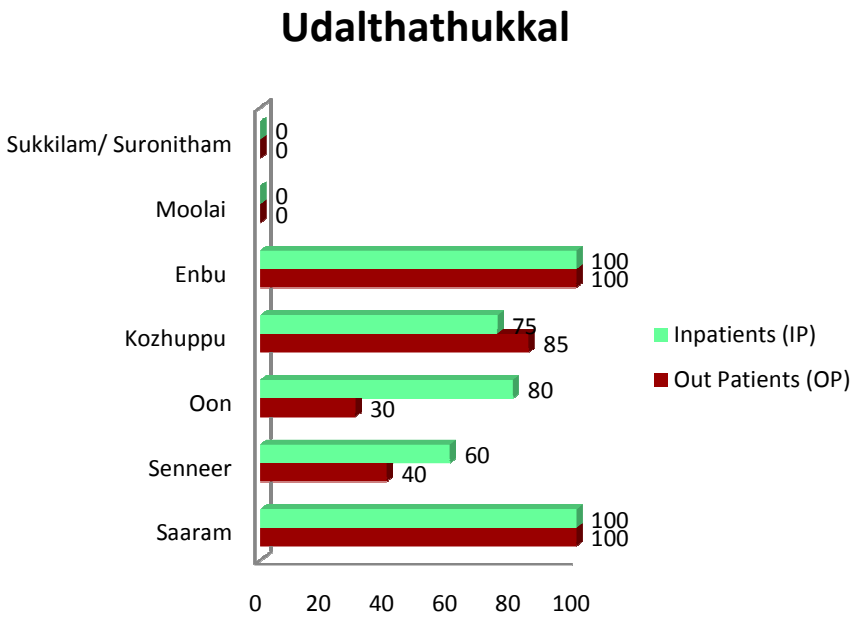
15% Santhigam. were affected, 100% was affected in Tharpagam and 100% in OP patients. 15% tharpagam was affected and100% Santhigam was affected in IP patients.

19) UDALTHATHUKKAL

Table 19: Udalthathukkal and relative percentage distribution

S.No	Udalthathukkal	Out Patients (OP)		Inpatients (IP)	
		No of cases	%	No of cases	%
1.	Saaram	20	100	20	100
2.	Senneer	8	40	12	60
3.	Oon	6	30	16	80
4.	Kozhuppu	17	85	15	75
5.	Enbu	20	100	20	100
6.	Moolai	0	0	0	0
7.	Sukkilam/ Suronitham	0	0	0	0

Figure 19: Udalthathukkal and relative percentage distribution



Inference :

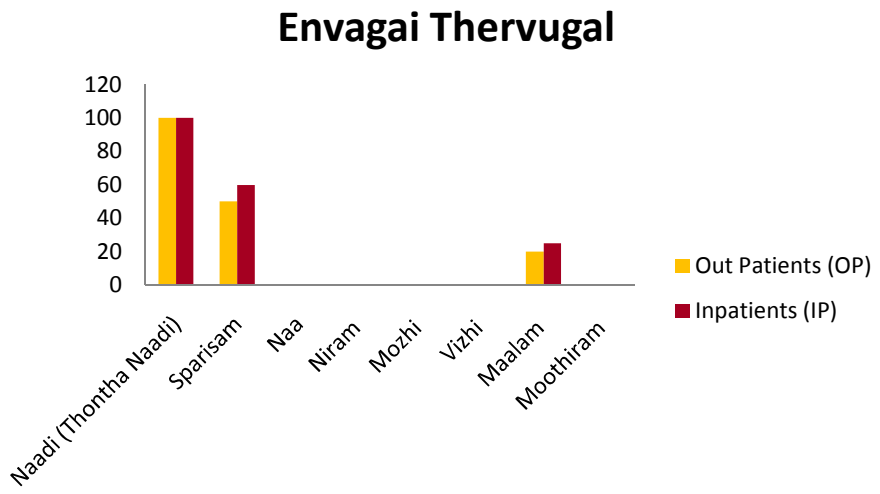
30% were affected in Oon . 40% were affected in Senneer,85% were affected in Kozhuppu,100%were affected in Enbu and Saaram. 20 In patients were selected, 80 % were affected in Oon,60% were affected in Senneer,75% were affected in Kozhuppu,100%were affected in Enbu and Saaram .

20) ENVAGAI THERVUGAL

Table 20: Envagai Thervugal and Relative percentage distribution :

S.No	Envagai Thervugal	Out Patients (OP)		Inpatients (IP)	
		No of cases	%	No of cases	%
1.	Naadi (Thontha Naadi)	20	100	20	100
2.	Sparisam	10	50	12	60
3.	Naa	0	0	0	0
4.	Niram	0	0	0	0
5.	Mozhi	0	0	0	0
6.	Vizhi	0	0	0	0
7.	Malam	4	20	5	25
8.	Moothiram	0	0	6	0

Figure 20: Envagai Thervugal and Relative percentage distribution :



Inference :

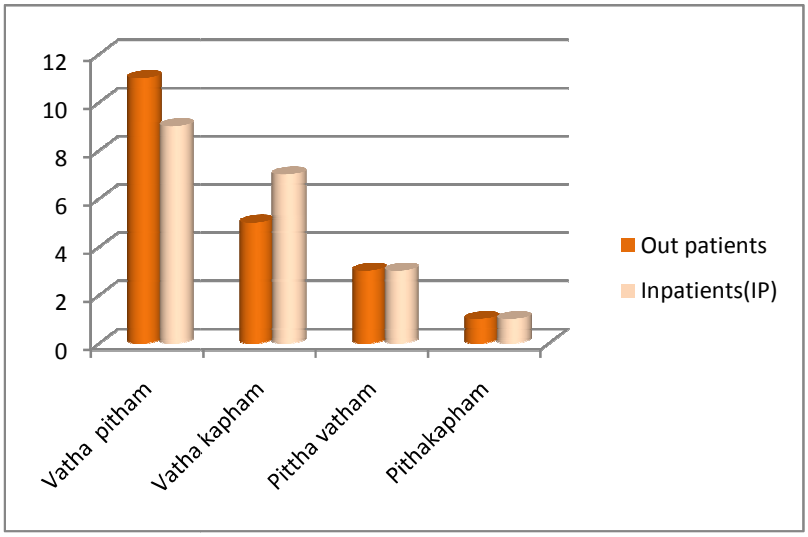
50% Sparisam was affected and 20% was affected in malam,100% Naadi was affected in OP patients. 60 % Sparisam was affected ,25% Malam was affected and 100% Naddi was affected in IP patients.

21) NEIKURI

Table 21: Neikuri distribution

S.No	Neikuri	Out Patients (OP)		Inpatients (IP)	
		No of cases	%	No of cases	%
1.	Vatha pitham	11	55	9	45
2.	Vatha kapham	5	25	7	35
3.	Pittha vatham	3	15	3	15
4.	Pithakapham	1	5	1	5

Figure 21: Neikuri distribution



Inference :

55% had Vatha pitham and 25% had Vatha kapham, 15% had Pitha vatham and 5% had piththa kapham nei kuri appearnce.

45 % had Vatha piththam , 35% had Vatha kapham, 15% had Piththa vatham and 5% had Piththa kapham neikuri appearance.

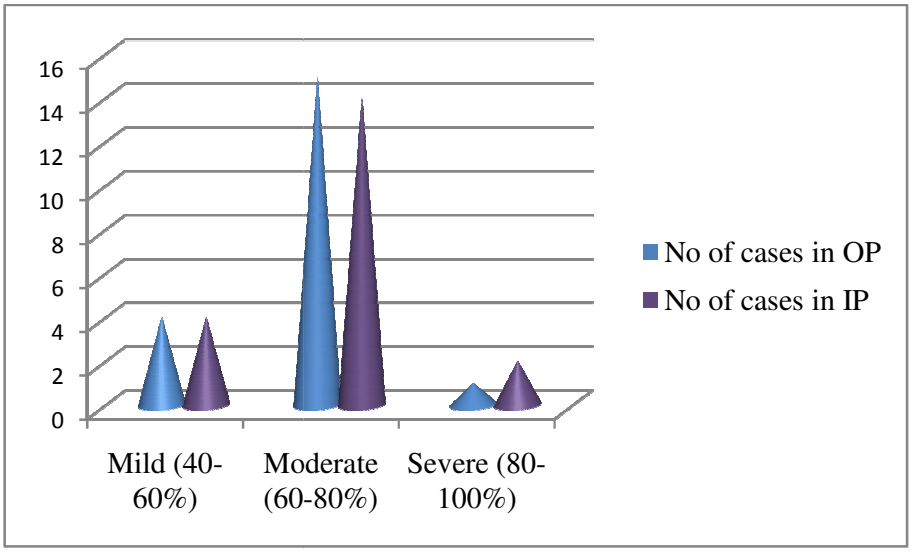
.

22) ASSESSMENT OF OUTCOME

Table 22 a :Before treatment Pain scale distribution

S.No	Pain scale	Out Patients (OP)		Inpatients (IP)	
		No of cases	%	No of cases	%
1.	Mild (40-60%)	4	20	4	20
2.	Moderate (60-80%)	15	75	14	70
3.	Severe (80-100%)	1	5	2	10

Figure 22.a :Before treatment Pain scale distribution



c

Inference :

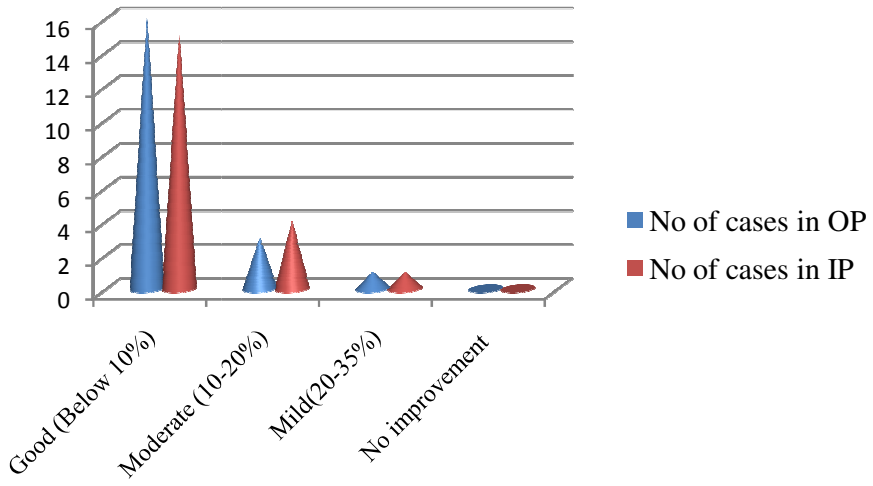
Table & figure no 22a showed, 75% was in moderate symptoms, 5% was affected in severe problems and 20% patients have mild symptoms were observed before starting the treatment in OP patients.

Table & figure no 22a showed 70% patients having moderate symptoms, 10% having severe symptoms, 20% having mild symptoms were observed before starting the treatment in IP patients.

Table 22.b:After treatment Improvement Pain scale distribution

S.No	Pain scale (Improvement)	Out Patients (OP)		Inpatients (IP)	
		No of cases	%	No of cases	%
1.	Good (Below 10%)	16	80	15	75
2.	Moderate (10-20%)	3	15	4	20
3.	Mild(20-35%)	1	5	1	5
4.	No improvement (Above 40%)	0	0	0	0

Figure 22 b: After treatment Improvement Pain scale distribution



Inference :

80% of cases had good response, 15% of cases had moderate response, 5% of cases had mild response were observed in OP patients.

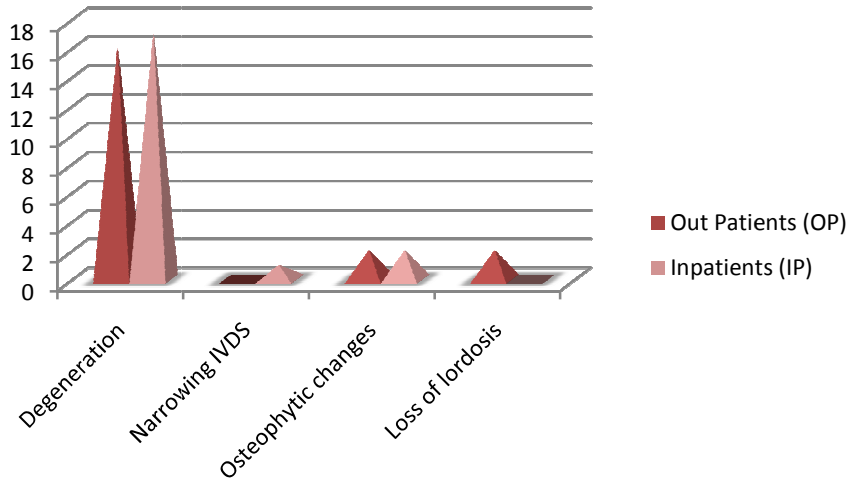
75% of cases had good response, 20% of cases had moderate response, 5% of cases had mild response were observed in IP patients.

23) RADIOLOGICAL FINDINGS :

Table 23: Radiological findings distribution

S.No	Radiological findings	Out Patients (OP)		Inpatients (IP)	
		No of cases	%	No of cases	%
1.	Degeneration	16	80	17	85
2.	Narrowing IVDS	0	0	1	5
3.	Osteophytic changes	2	10	2	10
4.	Loss of lordosis	2	10	0	0

Figure 23: Radiological findings distribution



Inference :

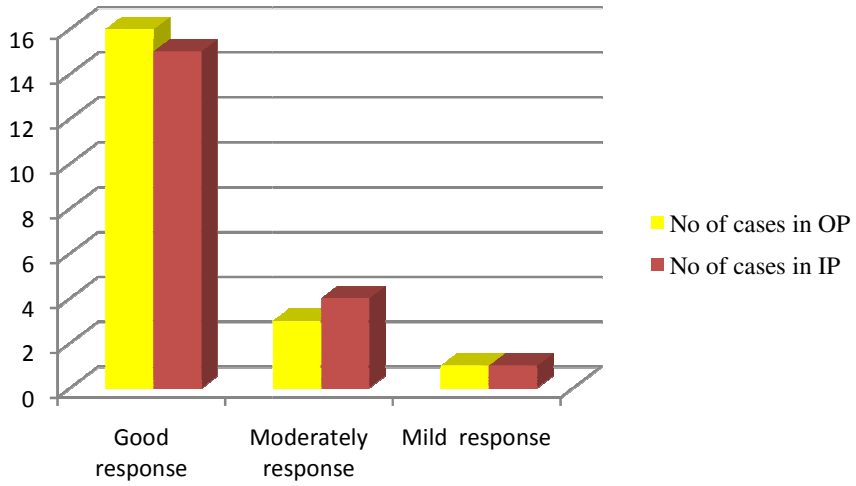
Mostly 80% of op cases had bony degeneration, 10% of the cases had osteophytic changes and 10% of the cases had altered lordosis were observed in radiological investigations. 85% of IP patients cases had bony degeneration, 5% of cases had narrowing IVDS and 10% cases had altered of lordosis were observed in radiological investigations.

24) GRADATION OF RESULTS

Table 24 : Gradation of Results distribution

S.No	Gradation of Result	Out Patients (OP)		Inpatients (IP)	
		No of cases	%	No of cases	%
1.	Good response	16	80	15	75
2.	Moderately response	3	15	4	20
3.	Mild response	1	5	1	5

Figure 24 : Gradation of Results distribution



Inference :

80% of cases had good response, 15% of cases had moderate response and 5% of cases had mild response in OP.

75% of cases had good response and 20% of cases had moderate response and 5% of cases had mild response in IP.

4.3.BIO STATISTICAL ANALYSIS

Evaluation of Pain score in Out patients

Descriptive Statistics

	Mean	Std. Deviation	N
Pain score OPB	33.5500	5.05210	20
Pain score OPA	4.0000	1.83533	20

Correlations

		Pain score OPB	Pain score OPA
Pain score OPB	Pearson Correlation	1	.528*
	Sig. (2-tailed)		.017
	Sum of Squares and Cross-products	484.950	93.000
	Covariance	25.524	4.895
	N	20	20
Pain score OPA	Pearson Correlation	.528*	1
	Sig. (2-tailed)	.017	
	Sum of Squares and Cross-products	93.000	64.000
	Covariance	4.895	3.368
	N	20	20
*. Correlation is significant at the 0.05 level (2-tailed).			

Pearson correlation (γ) before and after treatment among in patient is 0.528.One way analysis is variance ANOVA. P- value followed to be less than 0.0001 is considered to be extremely statistically significant.

There is strong evidence (t= 29.699, P< 0.0001) that the clinical trial drug importance the Ceganavatham patients. In this date set we could get a mean paired difference, df =19, with the confidence interval of 95% the null hypothesis is rejected, since P<0.0001. The relation is positive which means that as one variable goes up or down so will the other one.

The two tailed p value is less than 0.0001

Evaluation of Pain score in In patients

Descriptive Statistics

	Mean	Std. Deviation	N
Pain score BIP	62.9100	4.00157	20
Pain score AIP	8.0500	1.28042	20

Correlations

		Pain score BIP	Pain score AIP
Pain score BIP	Pearson Correlation	1	.593**
	Sig. (2-tailed)		.006
	Sum of Squares and Cross-products	304.238	57.700
	Covariance	16.013	3.037
	N	20	20
Pain score AIP	Pearson Correlation	.593**	1
	Sig. (2-tailed)	.006	
	Sum of Squares and Cross-products	57.700	31.150
	Covariance	3.037	1.639
	N	20	20
**. Correlation is significant at the 0.01 level (2-tailed).			

Pearson correlation (γ) before and after treatment among in patient is 0.593. One way analysis if variance ANOVA. P value followed to be less than 0.0001 is considered to be extremely statistically significant.

There is strong evidence (t=70.308, P<0.0001) that the clinical trial drug improves the patients. Mean paired difference, df = 19 with 95% confidence interval. The null hypothesis is rejected, since P< 0.0001 suggesting the relationship is a positive.

The two tailed p value is less than 0.0001

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Pain score OPB	20	33.5500	5.05210	1.12968
Pain score OPA	20	4.0000	1.83533	.41039
Pain score IPB	20	62.9100	4.00157	.89478
Pain score IPA	20	8.0500	1.28042	.28631

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Pain score OPB	29.699	19	.000	33.55000	31.1855	35.9145
Pain score OPA	9.747	19	.000	4.00000	3.1410	4.8590
Pain score IPB	70.308	19	.000	62.91000	61.0372	64.7828
Pain score IPA	28.116	19	.000	8.05000	7.4507	8.6493

Evaluation of Pain score in Total 40 patients

Oneway- Anova

Anova

		Sum of Squares	df	Mean Square	F	Sig.
Pain score B	Between Groups	8620.096	1	8620.096	415.064	.000
	Within Groups	789.188	38	20.768		
	Total	9409.284	39			
Pain score A	Between Groups	164.025	1	164.025	65.507	.000
	Within Groups	95.150	38	2.504		
	Total	259.175	39			

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Pain score B	Equal variances assumed	1.124	.296	-20.373	38	.000	-29.36000	1.44111	-32.27738	-26.44262
	Equal variances not assumed			-20.373	36.107	.000	-29.36000	1.44111	-32.28242	-26.43758
Pain score A	Equal variances assumed	.075	.786	-8.094	38	.000	-4.05000	.50039	-5.06300	-3.03700
	Equal variances not assumed			-8.094	33.953	.000	-4.05000	.50039	-5.06698	-3.03302

OP Cases (Pain score)

S.No	OP. No	Before treatment	After Treatment
1.	29933	60%	9%
2.	36631	76%	9%
3.	37539	68%	6%
4.	37586	70%	9%
5.	38816	76%	10%
6.	39106	55.5%	6%
7.	43818	66%	6%
8.	44873	70%	9%
9.	45456	62%	9%
10.	48017	76%	10%
11.	48386	76%	6%
12.	50815	70%	10%
13.	56705	68%	9%
14.	59216	57.7%	6%
15.	62476	66%	6%
16.	62938	84%	22%
17.	63604	53.3%	4%
18.	95942	70%	6%
19.	8211	76%	6%
20.	13600	74%	9%

IP Cases (Pain score)

S.No	IP. No	Before treatment	After Treatment
1.	1287	61.2%	8.2%
2.	1343	63%	7.4%
3.	1664	64%	8.8%
4.	1850	56.2%	6.6%
5.	2016	62%	8.5%
6.	2351	64%	7.5%
7.	2983	60%	9.5%
8.	3190	57.5%	6.2%
9.	44	65.8%	9.2%
10.	45	64%	6.5%
11.	56	64.5%	8.2%
12.	153	58.5%	6.5%
13.	170	62.2%	8.8%
14.	179	60.5%	6.2%
15.	190	58.5%	6.5%
16.	254	70.5%	10%
17.	271	72%	8.5%
18.	278	62.5%	9.5%
19.	280	64.5%	9.8%
20.	463	66.8%	8.6%

LABORATORY INVESTIGATION (OP PATIENTS)

S.No	OP.No	HAEMATOLOGICAL INVESTIGAION												URINE ANALYSIS					
		BEFORE TREATMENT						AFTER TREATMENT						BEFORE TREATMENT			AFTER TREATMENT		
		TC Cell/cu Mm	DC			ESR mm/ hr	Hb gms %	TC Cell/c umm	DC			ESR mm /1hr	Hb gms %	Alb umi n	Sug ar	Deposit epi/puscells	Alb umi n	Sug ar	Deposit epi/puscells
			P %	L %	E %				P %	L %	E %								
1	29933	7000	65	35	2	28	14.5	7400	62	36	2	18	11.4	Nill	Nill	NAD	Nill	Nill	NAD
2	36631	7500	67	31	2	25	14	9200	62	35	4	18	11.6	Nill	Nill	NAD	Nill	Nill	NAD
3	37539	8700	61	30	3	20	11.4	11500	62	35	5	15	11.4	Nill	Nill	1-2 Puscels	Nill	Nill	NAD
4	37586	8100	77	20	3	24	12.4	9400	65	23	9	18	12.6	Nill	Nill	1-2 epicells	Nill	Nill	NAD
5	38816	8500	68	28	4	20	12.2	8800	58	34	3	20	11.6	Nill	Nill	2-5 epicells	Nill	Nill	1-2epicells
6	39106	9800	62	32	6	15	13.2	9800	62	35	6	18	11.6	Nill	Nill	NAD	Nill	Nill	NAD
7	43818	7500	55	33	2	20	12.1	8000	58	34	4	20	11.8	Nill	Nill	NAD	Nill	Nill	NAD
8	44873	8700	59	38	6	25	11.5	8600	62	35	4	18	11.5	Nill	Nill	NAD	Nill	Nill	NAD
9	45456	9800	58	36	4	30	10.6	9800	60	36	4	18	10.8	Nill	Nill	2-5 epicells	Nill	Nill	1-3 epicells
10	48017	8100	67	30	3	33	12.8	9400	65	34	1	15	15.4	Nill	Nill	NAD	Nill	Nill	NAD
11	48386	8400	60	31	2	30	8.7	8700	63	35	2	14	10.6	Nill	Nill	1-2 puscells	Nill	Nill	NAD
12	50815	7800	55	44	1	34	11.3	8300	62	35	3	18	12.4	Nill	Nill	NAD	Nill	Nill	NAD
13	56705	8600	54	37	3	16	11.2	8700	65	33	2	13	11.8	Nill	Nill	NAD	Nill	Nill	NAD
14	59216	8300	45	30	5	15	10.8	9100	63	35	3	11	11.4	Nill	Nill	NAD	Nill	Nill	NAD
15	62476	9000	48	34	3	16	13.6	9300	61	38	1	18	14.2	Nill	Nill	1-2epicells	Nill	Nill	NAD
16	62938	6700	65	33	2	23	12.2	9000	60	37	3	12	13.4	Nill	Nill	NAD	Nill	Nill	NAD
17	63604	8800	45	30	3	15	12	8700	67	31	2	11	13.8	Nill	Nill	NAD	Nill	Nill	NAD
18	95942	8400	50	32	5	15	9.8	8800	62	34	4	13	11.4	Nill	Nill	NAD	Nill	Nill	NAD
19	8211	8200	52	30	5	17	12.4	8500	63	35	2	19	13.2	Nill	Nill	NAD	Nill	Nill	NAD
20	13600	7500	48	33	4	12	14	7800	61	36	3	15	14.8	Nill	Nill	1-3 epicells	Nill	Nill	NAD

LABORATORY INVESTIGATION (OP PATIENTS)

S.No .	OP.No	BIOCHEMICAL INVESTIGATION									
		BEFORE TREATMENT					AFTER TREATMENT				
		Sugar mgs %	Urea mgs%	Cholesterol mgs %	Bilirubin mgs%	Creatinine mgs %	Sugar mgs %	Urea mgs %	Cholesterol mgs %	Bilirubin mgs%	Creatinine mgs %
1	29933	105	18	150	0.6	0.4	95	16	180	0.6	0.6
2	36631	102	19	150	0.7	0.6	101	20	155	0.8	0.4
3	37539	108	16	195	0.4	0.9	108	19	195	0.6	0.7
4	37586	120	21	159	0.6	0.3	103	17	159	0.8	0.5
5	38816	89	18	168	0.5	0.8	89	20	170	0.3	0.6
6	39106	98	19	180	0.3	0.6	98	17	177	0.5	0.4
7	43818	129	22	161	0.9	0.4	110	22	160	0.7	0.8
8	44873	106	28	180	0.4	0.5	108	25	147	0.8	0.7
9	45456	107	19	150	0.5	0.7	98	19	168	0.3	0.4
10	48017	109	20	130	1.0	0.4	107	18	135	0.7	0.6
11	48386	95	18	170	0.7	0.8	103	13	185	0.4	0.5
12	50815	107	22	157	0.9	0.6	105	19	170	0.7	0.3
13	56705	98	29	204	0.3	0.9	89	25	190	0.5	0.7
14	59216	104	23	203	0.4	0.4	108	17	198	0.6	0.6
15	62476	92	27	197	0.7	0.6	85	23	193	0.5	0.4
16	62938	105	24	175	0.4	0.9	109	21	170	0.7	0.7
17	63604	94	17	193	0.9	0.5	98	19	187	0.6	0.7
18	95942	103	27	189	0.3	0.7	108	24	178	0.5	0.5
19	8211	108	31	180	0.5	0.8	102	27	168	0.7	0.3
20	13600	109	22	179	0.7	0.4	105	17	172	0.5	0.6

LABORATORY INVESTIGATION (IP PATIENTS)

S. No.	IP No	HAEMATOLOGICAL INVESTIGAION												URINE ANALYSIS					
		BEFORE TREATMENT						AFTER TREATMENT						BEFORE TREATMENT			AFTER TREATMENT		
		TC Cell/ cumm	DC			ESR mm/ hr	Hb gms %	TC Cell/ cumm	DC			ESR mm/ hr	Hb gms%	Albumin	Sugar	Deposit epi/puscells	Albumin	Sugar	Deposit epi/ puscells
			P %	L %	E %				P %	L %	E %								
1	1287	8500	61	28	3	24	11.2	8400	68	32	2	20	11.4	Nill	Nill	NAD	Nill	Nill	NAD
2	1343	6800	56	33	5	20	10.5	9000	58	40	3	16	10.8	Nill	Nill	NAD	Nill	Nill	NAD
3	1664	8700	60	35	5	12	9.4	9200	62	34	4	11	10.8	Nill	Nill	NAD	Nill	Nill	NAD
4	1850	7800	65	32	3	16	10.8	8400	64	33	3	13	11.4	Nill	Nill	1-3 epicells	Nill	Nill	NAD
5	2016	7600	60	36	4	20	10	8200	62	37	1	18	11.8	Nill	Nill	NAD	Nill	Nill	NAD
6	2351	8500	66	32	2	12	11.8	8700	65	32	3	8	11.4	Nill	Nill	NAD	Nill	Nill	NAD
7	2983	7100	67	31	2	18	10.2	8100	65	32	3	14	11.6	Nill	Nill	1-2 puscells	Nill	Nill	NAD
8	3190	9000	61	38	1	15	10.8	9200	65	34	1	12	12.4	Nill	Nill	NAD	Nill	Nill	NAD
9	44	8100	72	35	4	12	10.2	8400	63	35	2	10	11.8	Nill	Nill	NAD	Nill	Nill	NAD
10	45	7800	63	37	3	8	11	8200	65	37	1	12	12.2	Nill	Nill	NAD	Nill	Nill	NAD
11	56	8400	65	33	2	18	10.5	8600	63	35	2	15	11.2	Nill	Nill	NAD	Nill	Nill	NAD
12	153	8300	64	32	4	13	11	8900	62	36	2	17	11.6	Nill	Nill	NAD	Nill	Nill	NAD
13	170	7500	64	33	3	10	10.4	8100	64	35	1	12	11.2	Nill	Nill	NAD	Nill	Nill	NAD
14	179	11500	70	31	2	15	11.2	11200	67	32	2	13	11.8	Nill	Nill	1-2 epicells	Nill	Nill	NAD
15	190	6500	60	39	1	19	10.8	7800	70	30	0	12	11.9	Nill	Nill	NAD	Nill	Nill	NAD
16	254	8800	64	31	5	20	10.8	8900	64	33	3	18	11.4	Nill	Nill	NAD	Nill	Nill	NAD
17	271	9600	68	30	2	13	11.8	8400	64	32	4	12	11.2	Nill	Nill	NAD	Nill	Nill	NAD
18	278	8500	68	31	1	12	10.2	8000	65	33	2	13	13.8	Nill	Nill	NAD	Nill	Nill	NAD
19	280	8700	62	34	4	18	9.8	8800	64	33	3	19	10.6	Nill	Nill	1-2epicells	Nill	Nill	NAD
20	463	7100	68	29	3	20	10.5	7500	65	33	2	17	10.8	Nill	Nill	NAD	Nill	Nill	NAD

LABORATORY INVESTIGATION (IP PATIENTS)

S. No.	IP.No	BIOCHEMICAL INVVESTIGATION									
		BEFORE TREATMENT					AFTER TREATMENT				
		Sugar mgs %	Urea mgs%	Cholesterol mgs %	Bilirubin mgs%	Creatinine mgs %	Sugar mgs %	Urea mgs%	Cholesterol mgs %	Bilirubin mgs%	Creatinine mgs %
1	1287	93	21	165	0.3	0.7	98	19	140	0.5	0.8
2	1343	104	19	170	0.7	0.8	109	20	170	0.9	0.6
3	1664	101	25	140	0.5	0.4	107	21	135	0.7	0.4
4	1850	79	15	250	0.6	0.6	93	18	230	0.8	0.5
5	2016	80	23	145	0.5	0.8	84	12	150	0.3	0.6
6	2351	102	21	188	0.7	1.0	108	30	222	0.5	0.8
7	2983	105	27	227	0.9	0.7	97	23	207	0.7	0.5
8	3190	107	14	186	0.3	0.9	105	12	180	0.6	0.7
9	44	95	19	202	0.4	0.4	103	19	197	0.8	0.4
10	45	107	23	197	0.5	0.6	106	20	212	0.9	0.6
11	56	105	17	124	0.5	0.5	95	17	138	1.0	0.9
12	153	98	25	176	0.3	0.7	103	27	147	0.5	0.7
13	170	109	15	192	0.5	0.3	104	13	205	0.7	0.5
14	179	107	24	129	0.5	0.8	98	2s2	148	0.6	0.8
15	190	103	15	125	0.4	0.5	103	21	117	0.5	0.6
16	254	105	29	203	0.4	0.9	102	25	186	0.4	0.7
17	271	87	22	138	0.5	0.8	69	19	110	0.3	0.6
18	278	85	14	218	0.5	0.8	105	17	215	0.6	0.9
19	280	101	35	180	0.6	1.0	92	30	196	0.8	0.8
20	463	103	25	126	0.6	0.8	97	22	148	0.9	0.4

CASE REPORT OP 20 PATIENTS TREATED FOR CEGANAVATHAM

S. No.	OP NO	Name	Age	Sex	Occupation	Duration Of Illness	Date Of Admission	Treatment with drug/dose	Date Of Discharge	Total Number Of Days Treated	Radiological Findings	Result
1	29933	Chellammal	52	F	Tailor	3 yrs	30.03.2018	All are treated with internally *AppalakaraChooranam*2gm twice a day with water	29.04.2018	30 days	Cervical spondylosis	Good
2	36631	Kanthashamy	42	M	Loadman	4 yrs	23.04.2018		23.05.2018	30 days		Good
3	37539	Gobikirishna	44	M	Driver	6 months	25.04.2018		25.05.2018	30 days		Good
4	37586	Kaneshan	42	M	Farmer	2 yrs	26.04.2018		26.05.2018	30 days		Good
5	38816	Thangaraj	55	M	Auto driver	1 months	30.04.2018		30.05.2018	30 days		Good
6	39106	Malliga	54	F	House wife	1yrs	02.06.2018		O2.07.2018	30 days		Good
7	43818	Karthika	41	F	Clerk	2yrs	18.06.2018		18.07.2018	30 days		Good
8	44873	Rathnavel	59	M	Peedi worker	6 months	22.06.2018		22.07.2018	30 days		Good
9	45456	Annameri	58	F	Housewife	1 yr	25.06.2018		25.07.2018	30 days		Good
10	48017	Ravi	30	M	Driver	2 yrs	04.07.2018		03.08.2018	30 days		Fair
11	48386	Megala	57	F	Clerk	3 months	05.07.2018		04.08.2018	30 days		Fair
12	50815	Sivaneshan	53	M	Peedi worker	2 yrs	15..07.2018		14.08.2018	30 days		Good
13	56705	Sivaneshan	54	M	Office Assistant	2 months	06.07.2018		05.08.2018	30 days		Good
14	59216	Abiramavalli	57	F	House wife	6 months	16.07.2018		15.08.2018	30 days		Good
15	62476	Balu	58	M	Farmer	2 months	27.07.2018		26.08.2018	30 days		Good
16	62938	Vishnukumar	30	M	Clerk	1 months	29.07.2018		28.08.2018	30 days		Good
17	63604	Makarani	45	F	Housewife	3 months	30.08.2018		30.09.2018	30 days		Good
18	95942	Rajaludsumy	60	F	Hotel worker	1 year	20.11.2018		20.12.2018	30 days		Good
19	8211	Janshan	52	M	Auto driver	3months	22.01.2019		21.02.2019	30 days		Fair
20	13600	Selva	48	M	Tailor	2 months	06.02.2019		06.03.2019	30 days		Good

CASE REPORT IP 20 PATIENTS TREATED FOR CEGANAVATHAM

S. No.	IP NO.	Name	Age	Sex	Occupation	Duration Of Illness	Date Of Admission	Treatment with drug/dose	Date Of Discharge	Total Number Of Days Treated	Radiological Findings	Result
1	1287	Ananthy	36	M	Cottonmills	2 months	14.05.2018	All are treated with internally *AppalakaraChooranam* 2 gm twice a day with water	13.06.2018	30 days	Cervical spondylosis	Fair
2	1343	Vanaraj	43	M	Driver	2 months	21.05.2018		20.06.2018	30 days		Good
3	1664	Kuruvammal	50	F	Housewife	2 years	27.05.2018		26.06.2018	30 days		Fair
4	1850	Sankarapandiyan	60	M	Farmer	6 months	21.07.2018		20.08.2018	30 days		Good
5	2016	Sanmukanathan	52	M	Cotton mills	2 months	06.08.2018		06.09.2018	30 days		Good
6	2351	Nakarani	43	F	Teacher	1 year	17.09.2018		17.09.2018	30 days		Good
7	2983	Magaswary	60	F	Housewife	6 months	07.12.2018		06.01.2019	30 days		Good
8	3190	Ramasamy	46	M	Peediworker	6months	29.12.2018		28.01.2019	30 days		Good
9	44	Samuththirakani	60	F	Housewife	3 months	09.01.2019		08.02.2019	30 days		Good
10	45	Vadivu	60	M	Maison	3months	09.01.2019		08.02.2019	30 days		Good
11	56	Suppuluxmi	60	F	Housewife	3 months	14.01.2019		13.02.2019	30 days		Good
12	153	Ponmani	42	M	Hotelservant	1 year	24.01.2019		23.02.2019	30 days		Fair
13	170	Mani	52	M	Hotelservant	6 months	26.01.2019		25.02.2019	30 days		Good
14	179	Maddinjude	56	M	Farmer	6 months	28.01.2019		27.02.2019	30 days		Good
15	190	Kalpathulla	54	M	Farmer	1 year	30.01.2019		29.02.2019	30 days		Good
16	254	Jeyakumar	60	M	Tailor	3 months	05.02.2019		07.03.2019	30 days		Good
17	271	Vaithilinkaraja	58	M	Driver	3 yers	05.02.2019		07.03.2019	30 days		Good
18	278	Mathuraiveeran	55	M	Peedi worker	1year	06.02.2019		08.03.2019	30 days		Fair
19	280	Selvaladsumanan	31	M	Clerk	2 months	07.02.2019		09.03.2019	30 days		Good
20	463	Josepkanmani	60	M	Farmer	3 weeks	23.02.2019		25.03.2019	30 days		Fair

CHAPTER V

DISCUSSION

Importance of health and healthy life secures absolute attention of humanity advancement in the modern technology has enabled our present day society to exist in a world where the consent of hard work even moderate physical work is absolute and infashionable.The physical inactivity ,the sedentary life, food habits and environmental pollution causes by the diseases .The ***CEGANA VATHAM***" is a clinical condition, which was mentioned in **"*YUGI VAITHYA CHINTHAMANI* 800** ". Cegana vatham is one among the degenerative diseases in vatha disease.The clinical symptoms of ceganavatham is correlated in modern medicine as cervical spondylosis. The main clinical features of cegana vatham are painful neck, pain radiating to the upper limbs, giddiness, and tingling sensation over the upper limbs. Twenty IP and twenty OP cases were selected after excluding criteria. Siddha and Modern investigations was used to confirm the diagnosis and treatment (***APPALAKARA CHOORANAM)*** .

CLINICAL TRIAL OF *APPALAKARA CHOORANAM*

01. Incidence with Sex distribution:

The male ratio was higher than the female patients, 60% was male patients in OP and 65% patients was in IP.

02. Incidence with Age Distribution:

This study showed, statistically significant in higher incidence of ceganavatham 60% was affected in, above 40- 50 years in OP and 65% IP patients were affected in the age group of 51-60 years. Commonly this age is considered in degenerative bony changes occurred in cervical spondylosis.

03. Incidence with Kaalam:

Most of the patients were affected in Pitha kalam. In OP 90% and IP 95% of patients were affected in pitha kaalam.

04. Incidence with reference to Thega nilai:

Mostly Vatha piththa thegam was affected in cervical spondylosis.

05. Incidence with reference to Gunam :

The 55% in OP and 60% in IP patients affected wee with Rajogunam, who are more prone to psychological and physical stress.

06. Incidence reference to religion:

The more incidence was in Hindus 95% in OP and 90% in IP out of 40 patients.

07. Incidence with Thinai:

The highest prevalence in Neithal Nilam. The Siddha literatures mentioned that Neithal land is more incidence in Vatha disease. The 80% in OP and 70% in IP patients were affected. Most of the patients were coming from Thoothukkudi and Thiruchendur.

08. Distribution according to Paruva Kaalam

Most of the patients came during Kaar kaalam period. 45% in OP and 55% in IP patients were affected in Ceganavatham .

09. Incidence with reference to occupation:

Occupation of most of the patients strained themselves such as hard worker , weight lifter and tailors.This may be the reason for developed Cegana vatham.

10. Incidence with reference to Diet:

Most of the patients belong to non vegetarian. 75% in OP and 70% in IP patients were affected in non vegetarian.

11. Incidence with reference to Socio Economic Status:

70% of patients in OP and 85% of patients in IP patients were reported the signs and symptoms of Ceganavatham. The middle and lower class peoples were affected in ceganavatham.

12. Incidence with reference to etiological factor:

Age and occupation were the main precipitating factor in majority of the cases.

13. Incidence with reference to mode of onset:

All the patient were affected in chronic state.

14. Incidence with duration of illness:

Duration of illness in majority of cases were affected more than a year.

15. Incidence with Clinical Manifestations:

Neck pain and radiating pain towards upper limbs were presented in all cases (100%).

16. Incidence with reference to Gnanendrium:

Mei was affected in all cases.(100% in both OP&IP).

17. Incidence with reference to Kanmendrium:

Kai was affected in 100% of both OP& IP cases.

18. Conditions of Mukkuttram:

a. Disturbance in Vatham: Viyanan and Samanan were affected in all 40 cases (100%).The derangements of Viyanan produce pain and restricted neck movements .Devathathan was affected in 65% of OP and 35% in IP patients. It produces laziness due to pain.Abanan was affected in 20% of OP and 25% of IP patients.It affects bowel movements and produce constipation.

b. Disturbances in Pitham: Sathaga pitham was affected in all 40 cases (100%) which produce difficulty in performing daily regular activities. Analapitham was affected in 25% of OP and 15% of IP patients.Ranjagam was affected in 40% of OP and 60% of IP patients were affected in Cegana vatham.

c. Disturbance in Kapham: Santhigam was affected in all 40 cases (100%), which produced restricted neck movements.

19. Incidence with reference to Udalthathugal:

The Saram and Enbu were affected in 100% of both OP & IP cases. Disturbance of Saram produces symptoms like lethargy and mental depression, where as the derangement of kozhuppu and Enbu produced restricted neck movements and osteophytic changes in the cervical vertebrae.Disturbance in Senner was associated with anemia.Enbu affected in 100% of OP and IP patients.Oon affected in 30% of OP and 80% of IP patients.Senner was affected in 40% of OP and 60 % of IP patients.

20. Incidence with reference to Envagai Thervugal:

The analysis showed, the efficacy of this method and the prime importance of naadi. In the study all the OP and IP cases showed thontha nadi in which Vatha pitham naadi was predominant.Sparisam was affected in 50% of OP cases and 60% of IP cases. Sparisam was affected which was response for pain.

21. Incidence with reference to Neikuri:

In neikuri, the majority of cases were Vatha pitha neer &Vatha kapha neer.

22. Incidence with reference to assessment to outcome :

After treatment 80% of OP & 75% of IP cases relieved the good pain relief and 20% & 25% of OP and IP cases had reduced mild and moderate pain. It was confirmed by pain score.

23. Incidence with reference to Radiological studies:

X-ray cervical spine (AP& Lateral view) showed 80% -85% cases had degenerative changes occurred in OP and IP.

24. Incidence with reference to result:

80% &75% pain was reduced in OP and IP cases.20-25% cases had mild to moderate effect after administration of applakara chorrnam.

Modern Aspect investigation :

No significant changes were observed before and after the treatment.

Treatment:

The *APPALAKA CHOORANAM* (internal) – 2 gm, twice a day with water after food for 30days. During treatment all the patients were advised pathiyam (avoid tamarind, tubers and avoid pillows). The end of result showed very good clinical improvement (Reduced neck pain and improved neck movements).

Pain Reduction:

Pain scale measurement **NECK DISABILITY INDEX** revealed, the significant reduction in pain and increased range of motion.The pain score was reduced in 60-80% after administration of the applakara choornam.

Bio Statistical analysis

In Out Patient showed the marked changed in standard deviation, mean value is 5.05210 to 1.83533 and 33.5500 to 4.000 respectively. Pain score was reduced in Pearson correlation an sig.(2 tailed) test showed a significant reduced the score level is 0.017.

In In Patient mean and standard deviation was reduced from 62.9100 to 8.0500 and 4.00157 to 1.28042 respectively. The before and after Pearson correlation and sig.(2 tailed) results showed are to less than 0.0001. So, for Bio statistical the Appalakaram chooranam was significants reduced the pain.

CHAPTER VI

SUMMARY

20 cases in Ceganavatham were diagnosed clinically and admitted in Inpatients ward and treated with trial medicine. The 20 cases were treated as out patients in post graduate department of **Pothu Maruthuvam**, **Government Siddha Medical College &Hospital, palayamkottai** .

- The clinical diagnosis was done on the basis of clinical features as described in" **Yugi Vaithya Chinthamani-800"**.

- The ***Appalakara chooranam*** two gm twice daily along with water was given in all selected patients.

- The aetiology, pathology , clinical features, classification, and prognosis of the *Cegana vatham* were collected from the various literatures in siddha as well as modern medicine.

- Before starting the treatment careful detailed history was recorded in all selected cases.

- Laboratory diagnosis of Ceganavatham was done by Siddha and modern diagnostic methods of investigations.

- The trial medicine was corrected in deranged uyirthathukkal and udalthathukkal.So, the patients were relieved from the symptoms of neck pain, stiffness, radiating pain to the upper limbs. This confirms the efficacy of the trial medicine in curing the disease .

- The end results were found to be good relief from the symptoms within 10days of treatment in mild case. In moderate cases good relief was found between15-20 days of treatment. In severe cases mild improvement found after 30 days of treatment.

- During the period of treatment all the patients were put under pathiyam (A specific dietary regimen)

- The relief or improvement was observed only clinically and there was no changes in radiological findings.

- As per literary evidence Siddha Gunapadam Thathu Jeeva Vagupu, mentionend, of the trial medicine were controlling vatha disease.

- No toxic effects were noticed during the treatment period and pre clinical analysis of the *Appalakara chooranam.*All the drugs were put to use only after careful purification process laid down for them individually.

- The observations made during the clinical study showed ***Appalakara chooranam*** is clinically effective.

CHAPTER VII

CONCLUSION

- In this study, the treatment of cegana vatham with *Appalakara chooranam* was a good relief for the pain in ceganavatham.

- The relief (or) improvement was observed clinically by using pain score and movements of neck .

- The trial medicine has proved a significant action of Analgesic and Anti inflamatory activity, was confirmed by pharmacological studies.

- The presence of Carbonate, Chloride,Ferrous iron, sulphate and unsaturated compounds were found in Bio-chemical analysis.

- No toxic effects were noticed during the treatment period. It was confirmed by In Vitro – In Vivo, acute and sub-acute toxic studies.

- Bio statistically proved the *Appalakara chooranam* was significant reduced the pain and neck stability. ($P<0.0001$)

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ANNEXURE -I

PREPRATION OF THE TRIAL DRUGS

DRUGS NAME : APPALAKARA CHOORANAM

Purification and Preparation of *Appalakara Chooranam*

The Appalakaram collected and washed with water then added with water and boild finaly dry in sunlight. Purified Appala karam is grinded into powder in the Kalvam.

Ingredients of *Appalakara Chooranam*

TAMIL NAME	CHEMICAL NAME	CHEMICAL COMPOSITION	ACTIONS	THERAPEUTIC USES IN SIDDHA
Appala karam	*Sodium Carbonate or Subcarbonate of soda*	$Na_2 CO_3$	Annti inflammation, Annalgesic Antiulcer	Vatha Disease Gunmam.

Dosage : **30mg/ Kg/BW/daily two times a day**

Adjuvant : **water**

Duration : **30 days**

Reference : ***GunapadamThathu Jeevavaguppu Part II& III, Page No.368***

ANNEXURE II

NECK DISABILITY INDEX SCORE

- This questionnaire has been designed to give us information as to how your neck pain has affected your ability to manage in everyday life. Please answer ever section and **mark in each section only the one box that applies to you**

Section 1:-

Pain Intensity	SCORE	PATIENT'S SCORE
• I have no pain at the moment	0	
• The Pain is very mild at the moment	1	
• The Pain is moderate at the moment	2	
• The Pain is fairly severe at the moment	3	
• The Pain is very severe at the moment	4	
• The Pain is the worst imaginable at the moment	5	

Section 2:-

PERSONAL CARE (WASHING, DRESSING, etc)	SCORE	PATIENT'S SCORE
• I Can look after myself normally without causing extra pain	0	
• I Can look after myself normally but it causes extra pain	1	
• It is Painful to look after myself and I am slow and careful	2	
• I need some help but can manage most of my personal care	3	
• I need help everyday in most aspects of self care	4	
• I do not get dressed, I wash with difficulty and stay in bed	5	

Section 3:-

LIFTING	SCORE	PATIENT'S SCORE
• I Can lift heavy weights without extra pain	0	
• I Can lift heavy weights but it gives extra pain	1	
• Pain Prevents me lifting heavy weights off the floor, but I can manage if they are conveniently Placed, for example on a table	2	
• Pain Prevents me from lifting heavy weights but I can manage light to medium weights if they care conveniently positioned	3	
• I Can only lift very light weights	4	
• I cannot lift or carry anything	5	

Section 4:-

READING	SCORE	PATIENT'S SCORE
• I Can read as much as I want to with no pain in My neck	0	
• I can read as much as I want to with slight pain in my neck	1	
• I can read as much as I want with moderate pain in my neck	2	
• I Can't read as much as I want because of moderate pain in my neck	3	
• I Can hardly read at all because of severe pain in my neck	4	
• I cannot read at all	5	

Section 5:-

HEADACHES	SCORE	PATIENT'S SCORE
• I have no headaches at all	0	
• I have slight headaches, which come infrequently	1	
• I have moderate headaches, which come infrequently	2	
• I have moderate headaches, which come frequently	3	
• I have severe headaches, which come frequently	4	
• I have headaches almost all the time	5	

Section 6:-

CONCENTRATION	SCORE	PATIENT'S SCORE
• I Can Concentrate fully when I want to with no difficulty	0	
• I can concentrate fully when I want to with slight difficulty	1	
• I have a fair degree of difficulty in concentrating when I want to	2	
• I have a lot of difficulty in concentrating when I want to	3	
• I have a great deal of difficulty in concentrating when I want to	4	
• I Cannot concentrate at all	5	

Section 7:-

WORK	SCORE	PATIENT'S SCORE
• I Can do as much work as I want to	0	
• I Can only do my usual work, but no more	1	
• I Can do most of my usual work, but no more	2	
• I cannot do my usual work	3	
• I Can hardly do any work at all	4	
• I Can't do any work at all	5	

Section 8:-

DRIVING	SCORE	PATIENT'S SCORE
• I Can drive my car without any neck pain	0	
• I Can drive my car as long as I want with slight pain in my neck	1	
• I Can drive my car as long as I want with moderate pain in my neck	2	
• I Can't drive my car as long as I want because of moderate pain in my neck	3	
• I Can hardly drive at all because of severe pain in my neck	4	
• I Can't drive my car at all	5	

Section 9:-

SLEEPING	SCORE	PATIENT'S SCORE
• I have no trouble sleeping	0	
• My Sleep is slightly disturbed (less than 1hr sleepless)	1	
• My Sleep is mildly disturbed (1-2 hrs sleepless)	2	
• My Sleep is moderately disturbed (2-3 hrs Sleepless)	3	

• My Sleep is greatly disturbed (3-5 hrs sleepless)	4	
• My Sleep is completely disturbed (5-7 hrs sleepless)	5	

Section 10:-

RECREATION	SCORE	PATIENT'S SCORE
• I am able to engage in all my recreation activities with no neck pain at all	0	
• I am able to engage in all my recreation activities, with some pain in my neck	1	
• I am able to engage in most, but not all of my usual recreation activities because of pain is my neck	2	
• I am able to engage in a few of my usual recreation activities because of pain in my neck	3	
• I Can hardly do any recreation activities because of pain in my neck	4	
• I Can't do any recreation activities at all	5	

Neck disability Index Score ☐

Score: /50 Transform to percentage score x 100 = % points

- **Scoring:** For each section the total possible score is 5: If the first statement is marked the section score = 0, if the last statement is marked it = 5.
- If all ten Sections are completed the score is calculated as follows: Example: 16 (total Scored) 50 (Total Possible Score) x 100 = 32%
- If one section is missed or not applicable the score is calculated: 16 (total Scored) 45 (total Possible Score) x 100 = 35.5%
- Minimum Detectable change (90% Confidence):
  5 Points or 10% Points
  NDI developed by: Vernon, H.& Mior,

ANNEXURE III

SCREENING COMMITTEE CERTIFICATE

GOVT.SIDDHA MEDICAL COLLEGE PALAYAMKOTTAI

SCREENING COMMITTEE

Name of the candidate : Dr.Pasupathy Thavakeethan

Registration No: .....

DEPARTMENT OF POTHU MARUTHUVAM

This is to certify that the dissertation topic A Prospective open labeled Non Randomized phase-II clinical trial on mineral drug **"APPALA KARA CHOORANAM"** for the treatment of **CEGANA VATHAM** (Cervical Spondylosis) has been approved by the screening committee.

Branch	Department	Name	Signature
I	Pothu Maruthuvam	Prof.Dr.A.Manoharan MD(S)	
II	Gunapadam	Dr.A.Kingsly MD(S) (Associate Professor)	
III	Sirappu Maruthuvam	Prof.Dr.A.S.Poongodi Kanthimathi MD(S)	
IV	Kuzhanthai Maruthuvam	Prof.Dr.D.K.Soundararajan MD(S)	
V	Noi Nadal	Prof.Dr.S.Victoria MD(S)	
VI	Nanju nool Maruthuvam	Prof.Dr.M.Thiruthani MD(S) For	

Place : Palayamkottai

Date : 26.05.2017

PRINCIPAL
Govt. Siddha Medical College
Palayamkottai

ANNEXURE IV

IEC CERTIFICATE

INSTITUTIONAL ETHICAL COMMITTEE,
GOVERNMENT SIDDHA MEDICAL COLLEGE,
PALAYAMKOTTAI, TIRUNELVELI- 627002,
TAMIL NADU, INDIA.

Ph: 0462-2572736/2572737/2582010 Fax: 0462-2582010
Email ID: gsmc.palayamkottai@gmail.com

R.No.GSMC/5676/P&D/Res/IEC/2014 **Date: 29.05.2017**

CERTIFICATE OF APPROVAL

Address of Ethical Committee	Government Siddha Medical College, Palayamkottai-627002, Tirunelveli district.
Principal Investigator	**Dr.Pasupathy Thavakeethan, M.D(s),** First year, Department of PothuMaruthuvam, Reg. No: Not yet registered.
Supervisor & Guide	**Prof.Dr.A.Manoharan, M.D(s),** Head of the Department, Department of PothuMaruthuvam, Government Siddha Medical College and Hospital, Palayamkottai - 627002, Tirunelveli District drmanoharan25@gmail.com
Dissertation Topic	A Prospective open labelled phase – II Non -Randomized Clinical trial on mineral drug of ***"Appalakara Chooranam"*** for the treatment of **CEGANA VATHAM** (Cervical spondylosis)
Documents Filed	(1)Protocol (2)Data Collection Forms (3)Patient Information Sheet (4)Consent Form (5)SAE (Pharmacovigilance)
Clinical/Non Clinical Trial Protocol (Others-Specify)	Clinical Trial Protocol-yes
Informed Consent Document	Yes
Any other Document	Case Sheet/Investigation Documents
Date of IEC Approval & its Number	GSMC IV-IEC/2017/BR-I/06/29.05.2017

We approve the trial to be conducted in its presented form.

The Institutional Ethical Committee expects to be informed about the process report to be submitted to the IEC at least annually of the study, any SAE occurring in the course of the study, any changes in the protocol and submission of final report.

Chairman

(Prof. Dr. Murugesan M.D(s).,)

Member Secretary

29/5/17

(Prof.Dr.R.Neelavathy MD(s).,Ph.D.,)

ANNEXURE V

IAEC CERTIFICATE

K.M. COLLEGE OF PHARMACY – MADURAI

IAEC – CERTIFICATE

This is to certificate that the project title **A PROSPECTIVE OPEN LABELLED PHASE - II NON - RANDOMIZED CLINICAL STUDY OF "APPALAKARA CHOORANAM" INTERNALLY FOR "CEGANA VATHAM" (CERVICAL SPONDYLOSIS)** has been approved by the IAEC/PASUPATHY THAVAKEETHAN/TNMGRMU/ MD(S)/ 321611006/ KMCP/22/2018.

Dr. N. CHIDAMBARANATHAN

Name of the Chairman / Member Secretary IAEC:

Dr. P. THIRUPATHY KUMARESAN

Name of the CPCSEA Nominee

Signature with Date 11/3/18

INSTITUTIONAL ANIMAL ETHICAL COMMITTEE
K. M. COLLEGE OF PHARMACY
MADURAI-625 107.

11/3/18

CPCSEA NOMINEE
INSTITUTIONAL ANIMAL ETHICS COMMITTEE
K.M. COLLEGE OF PHARMACY
MADURAI-625 107

Chairman / Member Secretary of IAEC

CPCSEA Nominee

(Kindly make sure that minutes of the meeting duly signed by all the participants are maintained by office).

ANNEXURE VI

CTRI REGISTERED CERTIFICATE

FULL DETAILS (Read-only) -> Click Here to Create PDF for Current Dataset of Trial

CTRI No	**CTRI/2018/03/012681** [Registered on: 20/03/2018] **Trial Registered Prospectively**
Acknowledgement Number	REF/2018/02/017564
Last Modified On:	20/03/2018
Post Graduate Thesis	Yes
Type of Trial	Interventional
Type of Study	Siddha
Study Design	Single Arm Trial
Public Title of Study	A clinical study to study the drug Appalakara chooranam on Vatham
Scientific Title of Study	A Prospective open labelled phase II non randomized clinical trial on mineral drug of Appalakara Chooranam for the treatment of Cegana vatham (Cervical Spondylosis)
Acronym	

Secondary IDs if Any

Secondary ID	Identifier
NIL	NIL

Details of Principal Investigator or overall Trial Coordinator (multi-center study)
Clarification(s) with Reply
Modification(s)

Name	Dr Pasupathy Thavakeethan
Designation	PG Student
Affliation	Government Siddha Medical college and hospital
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Details Contact Person Scientific Query
Clarification(s) with Reply
Modification(s)

Name	Dr A Manoharan MD Siddha
Designation	Head of the Department and Professor
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Phone	9443886700
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Email	drmanoharan25@gmail.com

Details Contact Person Public Query
Clarification(s) with Reply
Modification(s)

Name	Dr A Manoharan MD Siddha
Designation	Head of the Department and Professor
Affliation	Government Siddha Medical college and hospital
Address	Department of Pothumaruthuvam Government Siddha Medical college and hospital palayamkottai Tirunelveli

ANNEXURE VII

CETIFICATE OF GUNAPADAM AUTHENTICITY

GOVERNMENT SIDDHA MEDICAL COLLEGE

PALAYAMKOTTAI

Certificate of Gunapadam Authenticity

Certified the following mineral drug used in Siddha formulation (Internal) **"APPALAKARA CHOORANAM"** for **CEGANA VATHAM** (Cervical Spondylosis) taken up for Post-Graduation Dissertation Studies by Dr.PASUPATHY THAVAKEETHAN PG Scholar MD siddha, Department of Pothu Maruthuvam are correctly identified and authenticated through Visual inspection / Organoleptic Characters / Experience, Education & Training Morphology Microscopically and Taxonomical methods.

Drug : APPALAKARA CHOORANAM

SL. NO	DRUG	CHEMICAL NAME
01.	Appalakaram	*Sodicarbonas Impura* *or* *Sodium Carbonate*

Station: Palayamkottai

Date: 07.02.2018

7/2/18

Authorized Signature

Dr. **A. KINGSLY** MD (S)
Reader
Head of the Department
PG Gunapadam
Govt. Siddha Medical College
Palayamkottai.

ANNEXURE VIII

CEETIFICATE OF MINERAL AUTHENTICATION

Certificate of Mineral Authentication

Certified the following Thathu (Mineral) drug used in Siddha formulation (Internal) **"APPALAKARA CHOORANAM"** for **CEGANA VATHAM** taken up for Post-Graduation Dissertation Studies by Dr. PASUPATHY THAVAKEETHAN, PG Scholar MD siddha, Department of Pothu Maruthuvam (Government Siddha Medical College, Palayamkottai), are correctly identified and authenticated through Visual inspection , Experience, Education and Training Morphology, Biochemical Methods.

SL. NO	Name	Chemical Name
1.	APPALAKARAM	*Sodiicarbonas Impura* *or* *Sodium Carbonate*

Tirunelveli - 11.

Station: 9/2/18

Date:

9/2/18

Authorized Signature

Dr. M. Kamalutheen, M.Sc.,M.Phil.,Ph.D
Head & Associate Professor
Dept. of Chemistry
Sadakathullah Appa College.
(Autonomous)
Tirunelveli - 627 011.
Tamilnadu, India.

ANNEXURE IX

RESARCH METHODOLGY CERTIFICATE

The Tamil Nadu Dr. M.G.R. Medical University

69, Anna Salai, Guindy, Chennai - 600 032.

This certificate is awarded to Dr/Mr/Mrs...PARVATHY...THAYAKEETHAN

for participating as Resource Person / Delegate in the XXIII Workshop on

"RESEARCH METHODOLOGY & BIOSTATISTICS"

Organized by the Department of Siddha,

The Tamil Nadu Dr. M.G.R. Medical University from 6th to 10th March 2017.

Dr. N. KABILAN, M.D.(Siddha)
PROF & HEAD
Dept of Siddha

Dr. T.BALASUBRAMANIAN M.S.,D.L.O.,
REGISTRAR

Prof. Dr. S.GEETHALAKSHMI, M.D.,Ph.D.,
VICE CHANCELLOR

ANNEXURE X

CME PROGRAME CERTIFICATES

GOVERNMENT SIDDHA MEDICAL COLLEGE

PALAYAMKOTTAI, TIRUNELVELI – 627 002

CONTINUING MEDICAL EDUCATION PROGRAMME

Conducted by

Post Graduate Department of Pothu Maruthuvam

This certificate is awarded to Dr / ~~Mr~~ / ~~Mrs~~...PASUPATHY...THAYAKEETHAN..... has participated in the CME Programme held on 05.12.2018 at Conference Hall, Special Therapy Wing, Government Siddha Medical College, Palayamkottai, Tirunelveli. This programme is focused on "HIV / AIDS"

Prof .Dr.A.MANOHARAN , M.D (s) , (Ph.D)
Head , Department of PothuMaruthuvam
Government Siddha Medical College,
Palayamkottai

Prof . Dr. R. NEELAVATHI, M.D(s)., Ph.D.,
Principal
Government Siddha Medical College
Palayamkottai

GOVERNMENT SIDDHA MEDICAL COLLEGE& HOSPITAL
PALAYAMKOTTAI

CME PROGRAMME

Conducted by
SIRAPPU MARUTHUVAM
DEPARTMENT
GSMCH - PALAYAMKOTTAI

Organised by
ASHTAVAIDYAN THAIKKATTU MOOSS
VAIDYARATNAM

Supported by
PG Student Council

S.No: 157

CERTIFICATE

This Certifies that

.....Dr. Pasupathy Thavakeethan.....

has participated in Continuing Medical Education on "**AYUSH External Therapies-II**" held at GSMCH, Palayamkottai on Dec, 4 2018

Dr. A.S.Poongodi Kanthimathi MD (s).,
Head - Dept. of Sirappu Maruthuvam

Authorised Signatory
VAIDYARATNAM

Dr. R. Neelavathy MD (s), Ph.D.,
Principal

ANNEXURE XI

CERTIFICATE OF ORAL PRESENTED PAPER

AMRITA VISHWA VIDYAPEETHAM | School of Ayurveda

ĀCĀRA

IASTAM INDIA

CERTIFICATE OF

PARTICIPATION

This is to certify that

Dr. Pasupathy Thavakeethan

presented a paper titled **ROLE OF RASA THAILAM IN PUTRU NOI (MALIGNANCY) TREATMENT** at the **Conclave on Cancer Care and Research: Developing a Roadmap,** jointly organised by Amrita Centre for Advanced Research in Ayurveda, Amrita School of Ayurveda and Indian Association for the study of Traditional Asian Medicine (IASTAM) from February 15- 17 2019 at Amrita Institute of Medical Sciences, Kochi, Kerala

Br. Sankara Chaitanya	Dr. Narendra Bhatt	Dr. Rammanohar P
Medical Director	President	Research Director
Amrita School of Ayurveda	IASTAM	ACARA

Eligible for Five CME Credit Hours Vide Letter No D2454/19/MC/CME/ISM dated 6 Feb 2019

ANNEXUE XII

INTERNATIONAL JOURNALS

International Journal of Reverse Pharmacology and Health Research (IJRPHR)

Research article

A Spectroscopic and FTIR analysis of Siddha Mineral drug Appalakara Chooranam

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Abstract

Background: The Siddha system of medicine is one among part of the AYUSH system.The siddha medicine is using various clinical conditions,especially in degenerative diseases and gastro intestinal disorders .Almost it has prepared the medicines from Herbals ,Minerals salts and Metalsas well as the marine and animals products also used in the system. The drug Appalakara chooraranam is basically salt in taste and crystal powder in nature which is widely used in siddha medicine for Gastro –intestinal disorders.

Objective: To explore the morphology and elemental characterization of the mineral salt *Appalakara chooranam*

Methods: The structural morphology and characteristic features using in SEM, determination of trace elements by Energy dispersive X-ray analysis and Functional Group through FTIRstudy. It can be correlated in WHO recommended parameters for confirmed the standardizations in above drug.

Results: The results correlated in SEM analysis showed Average Particle Size ranges from 296 µm to 2792 µm.In FTIR studies should markedly increase value from 3462.22 to 3695.61 respectively, which is indicated its contains most of them in Phenolic compound, Halo compound and Isothiocyanate.In EDAX experiment results showed most of them contains Sodium&Potassium.

Conclusion: All the modern scientific parameters provide it is minimal size particals and good characteristic nature of the drug. So *Appalakara chooranam is* highly therapeutic and bio availability value used cured in gastro intestinal tract diseases.

Keywords

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CODENJ : IJRPHR

To access this article online

Website : http://www.ijrphr.com/

DOI : 10.121/ijrphr/02.0203.306

Quick response code

Introduction

The World Health Organization (WHO) is estimated that 80% of populations were used traditional medicinesin developing countries for primary health care needs (WHO Guidelines-2007). In that way, Siddha medicine has profound vitalrole in disease, prevention and prophylaxis through its herbal medicine and other form of medicine like chendooram, Parpam and other 32 types ofpreparation (Thiyagarajan.R-2006).

How to cite this article:

Thavakeethan P, Manoharan A, A Spectroscopic and FTIR analysis of Siddha Mineral drug *Appalakara Chooranam*, International Journal of Reverse Pharmacology and Health Research, 2019, 2(1), 16-20

Received: January, 2018.

Accepted: March, 2019.

Int J Pharma Res Health Sci. 2019; 7 (2): 2948-51
DOI:10.21276/ijprhs.2019.02.05
Thavakeethan and Manoharan A. CODEN (USA)-IJPRUR, e-ISSN: 2348-6465

PHS Scientific House
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International Journal of Pharma Research and Health Sciences

Available online at www.pharmahealthsciences.net

Original Article

Toxicity Study on Siddha Formulation *Appalakara chooranam* in Albino Rat

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ARTICLE INFO

Received: 19 Apr 2019
Accepted: 29 Apr 2019

ABSTRACT

Background: The Siddha medicine is an one among the AYUSH system, it is based on pancha bootha theory. Every human body is constructed by the Thathuvams. In Siddha Medicine widely used in herbals, mineral and metallic preparations. All metallic and minerals are purified before using the drugs. The mineral *Appalakara chooranam* (Sodium carbonate) is widely used in Siddha practice for curing Gastro-intestinal disorders and neuromuscular disease. **Objective:** To determine about the acute and sub-acute toxicity of *Appalakara chooranam* (AKC) in female Wister albino rat models. **Materials and Methods:** Acute toxicity was carried out female Wister albino rat, a single dose of 2000mg of *Appalakara chooranam*. **Results:** In acute toxicity studies showed no significant changes in normal growth pattern, body weight and safety profiles are within nomal limits. It was compared Standard and treatment groups. There was a slightly changed in plasma glucose level after administration of AKC. In Sub acute toxicity experiment showed no markedly changes in Liver enzymes and internal organs. **Conclusion:** The end of study, there was no an undesirable toxic effect of all internal organs, So AKC is a safety for consumption in long period.

Keywords: Siddha medicine, *Appalakara chooranam*, Rat models.Toxicity

1. INTRODUCTION

The World Health Organization (WHO) estimated that 80% of populations of developing countries really on traditional medicines, mostly plant drugs, for their primary health care needs [1]. In that way, Siddha medicine has profound role in disease prevention and prophylaxis through its herbal medicine and other form of medicine like chendooram, Parpam, waxy form etc [2, 3].

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ANNEXURE XIII

PLAGIARISM REPORT

URKUND

Urkund Analysis Result

Analysed Document:	Thavakeethan.docx (D53946993)
Submitted:	6/18/2019 1:26:00 PM
Submitted By:	jeromstat@gmail.com
Significance:	12 %

Sources included in the report:

http://repository-tnmgrmu.ac.in/7065/1/320301409jeyabharathi.pdf
http://repository-tnmgrmu.ac.in/10243/
http://repository-tnmgrmu.ac.in/531/1/3201014karthikt.pdf
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http://repository-tnmgrmu.ac.in/9590/
a8463bbb-4705-4a46-b007-bdc15cc6482b

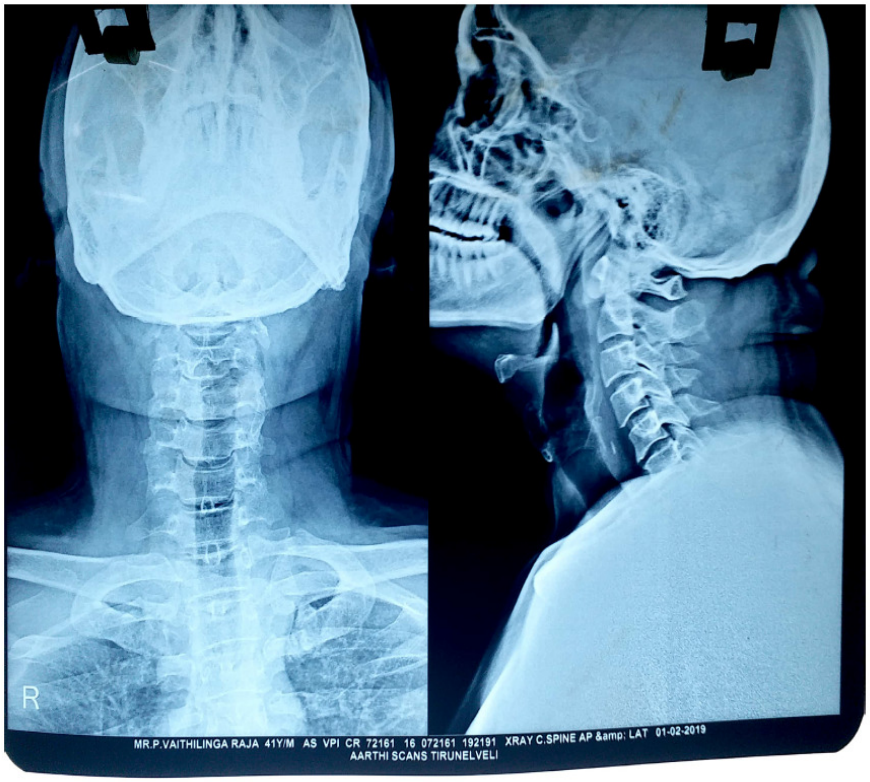
Instances where selected sources appear:

95

ANNEXURE XIV

INVESTIGATION FIGURE OF CERVICAL SPONDYLOSIS FOR DIAGNOSIS PURPOSE

X-RAY



AARTHI SCANS & LABS

ISO 9001:2015 ORGANISATION

Name	MR.P.VAITHILINGA RAJA	Patient ID	AS_VPI_CR_72161
Accession No	16_072161_192191	Age/Gender	41Y / Male
Referred By	Dr.GOVT.SIDDHA MEDICAL COLLEGE	Date	07-Feb-2019

X - RAY - CERVICAL SPINE AP & LATERAL VIEWS

OBSERVATION:

Anterior osteophytes noted in C5 & C6 vertebra.

Rest of the vertebral bodies and intervertebral disc spaces appear normal.

Alignment of the vertebrae is normal.

Atlas and axis are normal.

Atlantodental interspace is normal.

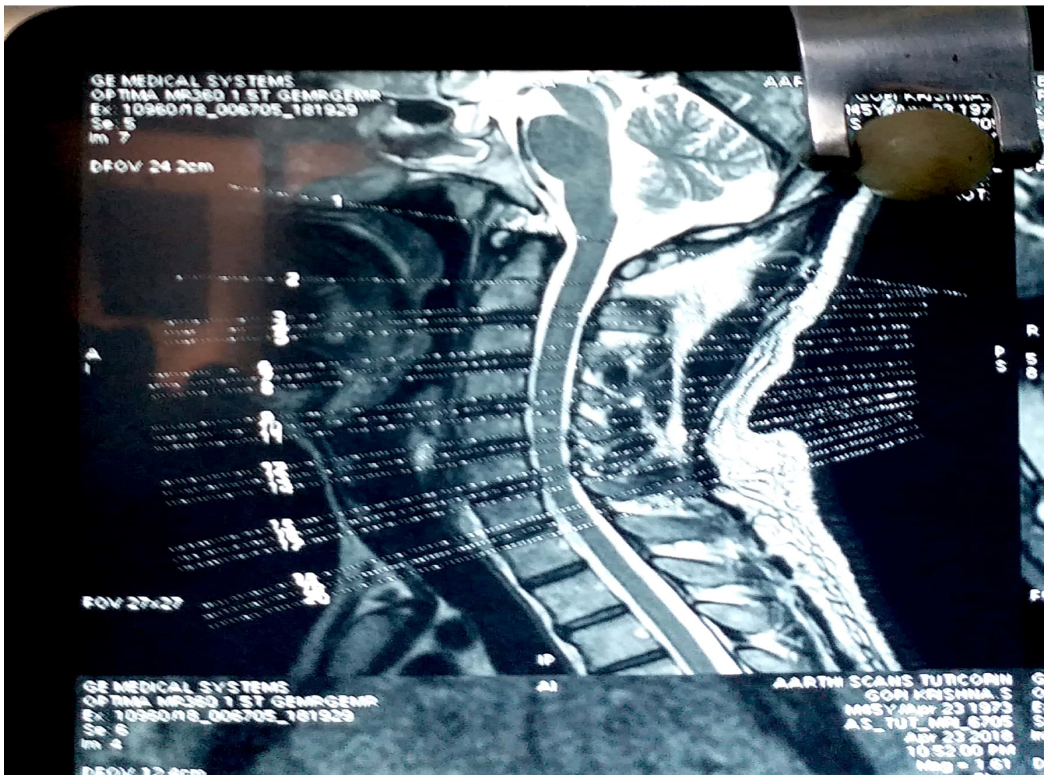
Prevertebral soft tissues are normal.

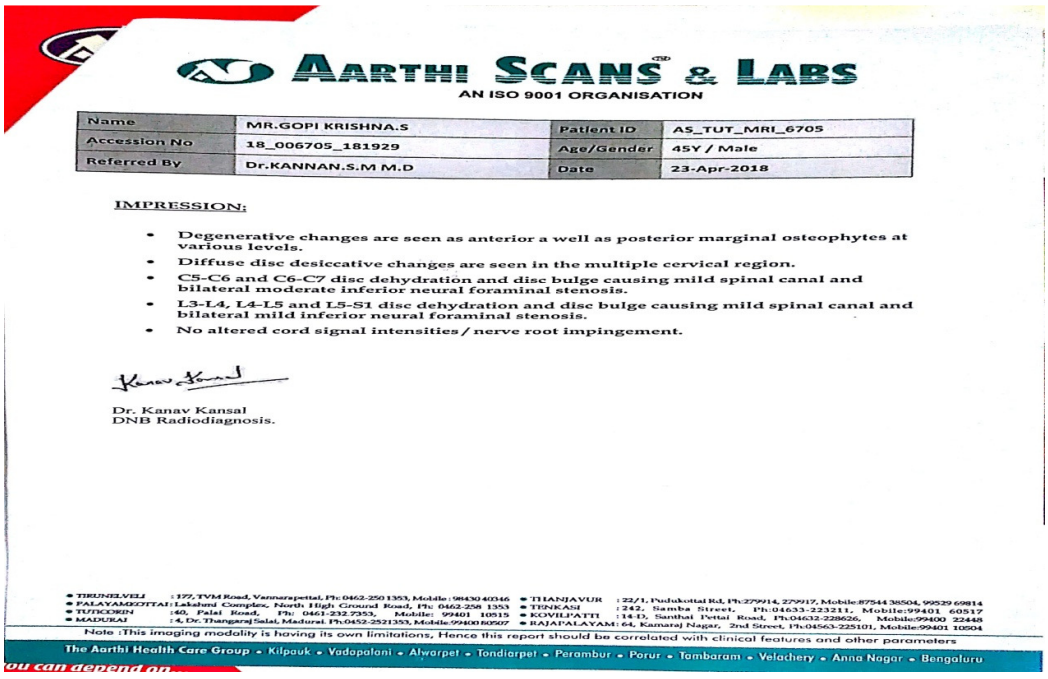
IMPRESSION:

- **Degenerative changes in cervical spine.**

DR. M. VENKATESAN., MDRD.,
CONSULTANT RADIOLOGIST.

MRI





AARTHI SCANS & LABS

AN ISO 9001 ORGANISATION

Name	MR.GOPI KRISHNA.S	Patient ID	AS_TUT_MRI_6705
Accession No	18_006705_181929	Age/Gender	45Y / Male
Referred By	Dr.KANNAN.S.M M.D	Date	23-Apr-2018

IMPRESSION:

- Degenerative changes are seen as anterior a well as posterior marginal osteophytes at various levels.
- Diffuse disc desiccative changes are seen in the multiple cervical region.
- C5-C6 and C6-C7 disc dehydration and disc bulge causing mild spinal canal and bilateral moderate inferior neural foraminal stenosis.
- L3-L4, L4-L5 and L5-S1 disc dehydration and disc bulge causing mild spinal canal and bilateral mild inferior neural foraminal stenosis.
- No altered cord signal intensities / nerve root impingement.

Dr. Kanav Kansal
DNB Radiodiagnosis.

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• PALAYAMKOTTAI: Lakshmi Complex, North High Ground Road, Ph: 0462-258 1353
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• KOVILPATTI : 14-D, Santhai Pettai Road, Ph:04632-228626, Mobile:99400 22448
• RAJAPALAYAM: 64, Kamaraj Nagar, 2nd Street, Ph:04563-225101, Mobile:99401 10504

Note :This imaging modality is having its own limitations, Hence this report should be correlated with clinical features and other parameters

ANNEXURE XV

NEIKURI FIGURES OF CEGANA VATHAM FOR SIDDHA DIAGNOSIS